Understanding farm entry and farm exit in Korea

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ABSTRACT

In recent years, the Korean government has sought to encourage rural young people to enter farming and older farmers to leave it. The government's tool for promoting this inter-generational change has been agricultural structural adjustment policy, which includes farm entry policy, farm exit policy, competitiveness policy, and rural development policy. However, the number of young farmers has decreased and number of old farmers has increased. This research investigates why agricultural structural adjustment policy has failed, analyzing survey data on farm entry and exit using regression analysis, and with procedures enhanced by bootstrapping.

The conclusions of the research are as follows. Agricultural structural adjustment policy does not induce young people to enter farming mainly because: 1) Rural young people have as little enthusiasm for farming as their urban counterparts; and 2) Competitiveness policy cancels the effects of farm entry policy. Meanwhile, agricultural structural adjustment policy has not induced old farmers to retire mainly because: 1) Older farmers are as reluctant to leave farming as younger ones; 2) Farm exit policy does not promote farm exit; and 3) Competitiveness policy and rural development policy, as well as farming conditions and farm exit barriers, cancel the effects of farm exit policy.

I dedicate this thesis to my father and younger brother.

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My mother and sisters have, throughout my absence, been concerned for my welfare. My mother has put my mind ease; and my sisters have been good to my mother, which has been a great encouragement to me during my doctoral work.

My mother-in-law willingly spent time in the US and helped to make up for my absence by taking care of my wife and sons. This meant that my father-in-law had to spend a great deal of time alone in Korea, but his main concern was always for us.

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INTRODUCTION

1.1 Background to the research

During the past few decades, many countries have experienced significant structural change in their agricultural systems (Williams and Farrington, 2006) as a consequence of economic development (Diakosavvas, 1993): changes in market prices for farm produce, diversification of the economic activity of farm households, trends in the labour market, and agricultural policies devised by governments (Knickel, 1990). Trade liberalization too has accelerated structural adjustment in the agricultural industry across the world (Lobley, 2010; Murray et al., 2004; Chavas, 2001; Rehber, 2000). Under the pressure of these kinds of challenges, structural adjustment of agriculture has increasingly become a concern for OECD countries (Alston et al., 1995).

Weak agricultural structures with low productivity and high production costs have become an urgent problem, requiring a process of agricultural structural adjustment; and therefore achieving an adequate agricultural structure has been located at the centre of agricultural policy in OECD countries (Boehlje, 1999; Alston et al., 1995). This has meant that agricultural structural adjustment policy has been used as an instrument to solve agricultural and rural problems (Antón, 2008; Blandford and Hill, 2006), with the main goal of making agricultural structure more competitive and more efficient (Happe, 2004) when judged by economic, social and political standards (Harris, 2008a; Blandford and Hill, 2005).

With the advent of the era of market liberalization, changes in agricultural structure and the use of agricultural structural adjustment policy to mitigate the effect of those changes have

become the primary concern of many countries (Alston et al., 1993). And, due to the dynamic connection between structural change and agricultural structural adjustment policy, there has been a good deal of research on the relationship between farm structure (for example off-farm work, farm size) and productivity (Ahearn et al., 2002; Huffman and Evenson, 2001), between structural change and the environment (Buttel and Gertler, 1982), between market liberalization and agricultural structure (Biggs et al., 2004), between agricultural policy and market factors (Happe, 2004; OECD, 1995; Goddard et al., 1993), and between public intervention through research and development and features such as farm size, degree of specialization, and off-farm work (Ahearn et al., 2002; Huffman and Evenson, 200l).

Amongst the factors that combine to determine agricultural structure (such as farm size, the age distribution of farmers, and farm ownership), farm entry and farm exit are significant (Ahearn et al., 2002). First of all, smooth processes of farm entry and exit contribute to the competitiveness of a country's farming industry (Horpe and Korb, 2006: p.2).

> *"The lack of young farmers puts under risk the survival of the sector itself, given that the main effect of an inadequate rate of generational turnover is that the exit of farms from the sector for ageing is not balanced by the entry of new farms run by young farmers. . . The competitiveness of the sector suffers from the lower investment and innovation propensity of elder farmers" (Carbone and Subioli, 2008: p. 2).*

The quality of human capital, such as number of years' schooling and extent of farming skills (Blandford and Hill, 2005) and education (Blandford and Hill, 2005; Rozelle and Swinnen, 2004), positively affect the farming industry and, in combination with smooth processes of farm entry and exit, raise the level of agricultural productivity and competitiveness (Weston

and Whatman, 2008) by virtue of a ‘succession effect’ or ‘successor effect’ (Lobley, 2010:4).

But empirical research on the effect of agricultural structural adjustment policy on farm entry and exit is a relatively neglected area, although the effect of the demographic and socio-economic characteristics of farmers on farm entry and exit (Väre, 2006; Rossier and Weiss, 2006; Glauben et al., 2003; Pietola et al., 2003; Kimhi and Nachlieli, 2000; Stiglbauer and Weiss, 2000; Kimhi and Bollman, 1999 et al.) and the migration of rural people between economic sectors and between regions have been the subject of research by Stark and Lucas (1988), Stark (1982), and Todaro (1969).

Meanwhile, in the case of Korea, agricultural structural adjustment policy, which is divided into farm entry policy, farm exit policy, competitiveness policy, and rural development policy, has, in an effort to cope with trade liberalization, been central to long term agricultural and rural development plans since the 1990s, and is still an urgent goal (OECD, 2008). The government has endeavored to decrease the number of old farmers and increase the number of young farmers, in order to strengthen the competitiveness of the agriculture industry in the international market. It has tried to do this through diverse programs and projects such as the successor farmer set-up program, the direct payment for farmland transfer program, and the training institute support program, because disharmony between farm entry and farm exit is believed to disadvantage the farming industry in the face of global competition (Williams and Farrington, 2006).

But, according to the National Statistics Office (NSO, 2008), not only has the number of old farmers increased rapidly, but the number of young farmers has sharply decreased. Given this situation, some researchers (Ahn et al., 2003) have argued that agricultural structural adjustment policy cannot facilitate farm entry, because prospective farmers, for example

agricultural college students, do not see farming as an attractive job opportunity. And Lee (2007) et al. also argue that agricultural structural adjustment policy cannot affect structural change because farm entry and exit are likely to be influenced almost wholly by external macro-economic factors, for example the unemployment rate and the state of the domestic economy. Further, it has been argued that agricultural structural adjustment policy is ineffective, and that financial investment in the agricultural industry has not contributed to the industry's development (Lim and Cho, 2004). Huffman and Evenson (2001) has also argued that agricultural policies do not affect aspects of agricultural structure such as farm size, degree of specialization, and amount of off-farm work. But other researchers (Kim, 2007) have argued that agricultural structural adjustment policy could facilitate farm entry and exit, because old farmers would be likely to exit from farming if they received appropriate economic incentives, and young people would be likely to enter farming if they expected that they could earn a better income from farming than from a non-farm job.

Although agricultural structural adjustment policy is a way of affecting agricultural structure in areas like farm entry and exit, and developed countries have intervened in their agricultural sectors to improve competitiveness and efficiency through agricultural structural adjustment policy (ADAS et al., 2004; Happe, 2004), little research has been conducted on the effect of agricultural structural adjustment policy on farm entry and exit. Further, despite the above-mentioned debate on the effect of agricultural structural adjustment policy on farm entry and exit in Korea, there is little research available on which this debate can draw.

Therefore, a study of the effect of agricultural structural adjustment policy on farm entry and exit is attracting the interest of researchers, policy makers, tax payers, and farmers, as part of the debate on the efficacy of agricultural investment (Kim and Huh, 2008); and this kind of

research is expected to contribute to the development of agricultural structural adjustment policy and the agricultural industry in general.

1.2 The research question and hypotheses

The origin of agricultural structural adjustment policy in Korea is the anticipation that higher income from non-farm sectors, cheaper farming products from foreign countries, and unfavourable living conditions in rural areas could drive competent young people from farming and leave behind old farmers, which could eventually lower the competitiveness of the farming industry and threaten its viability (Ministry of Agriculture and Forestry, 1991). Although the government intends to use its powers to facilitate farm entry and exit and smooth intergenerational change, and has done this since the 1990s by providing economic incentives and social safety nets such as job placements, job training and retirement subsidies, the tendency for young people to leave agriculture and for old farmers to stay on continues.

So, why does agricultural structural adjustment policy, with government interventions such as financial incentives to facilitate farm entry and exit, not stop the trend towards a decrease in young farmers and an increase in old farmers?

1.2.1 Farm entry

Why does agricultural structural adjustment policy not stop the trend towards a decrease in young farmers?

I argue that this is due to the low probability of rural-born young people entering farming in South Korea, the incompatibility of farm entry policy, competitiveness policy, and rural development policy, and the fact that farming conditions and farm entry barriers also hinder the farm entry of prospective farmers.

First, I argue that young people who are born in a rural area do not have a higher probability of farm entry than urban born young people, and that an agricultural structural adjustment policy which is intended to make rural-born young people stay in farming does not prevent them from leaving. To investigate this argument, null hypothesis H_{01} and alternative hypothesis H_{A1} were formalized as follows.

H_{01}: Rural-born prospective farmers are more likely to take up farming than urban-born people.

H_{A1}: Rural-born prospective farmers are not more likely to take up farming than urban-born people.

Second, I argue that farm entry policy does not contribute to farm entry, because competitiveness policy or rural development policy cancel out the effects of farm entry policy, due to their mutual incompatibility. For example, although competitiveness policy promotes farm entry by making young people feel more positive about a farming job, rural development policy can have a negative effect on farm entry by creating other non-farm job opportunities in a rural area. To investigate this argument, null hypothesis H_{02} and alternative hypothesis H_{A2} were formalized as follows.

H_{02}: Farm entry policy contributes to farm entry, and competitiveness policy and rural development policy do not cancel out the effect of farm entry policy.

H_{A2}: Either farm entry policy does not contribute to farm entry, or competitiveness policy or rural development policy cancels out the effect farm entry policy.

Third, I argue that farming conditions hinder prospective farmers' farm entry. According to previous studies by Kimhi (1994), Todaro (1969), and Kang (2004), farming conditions such as farming income and living conditions in rural areas affect farm entry. For example, if farming income and the quality of life in rural areas are inferior to those of non-farm jobs and

life in urban areas, the effect of farm entry policy could be limited. To investigate this argument, null hypothesis H_{03} and alternative hypothesis H_{A3} were formalized as follows.

H_{03}: Farming conditions are not the cause of low likelihood of farm entry.
H_{A3}: Farming conditions are the cause of low likelihood of farm entry.

Fourth, I argue that farm entry barriers hinder prospective farmers' farm entry because they prevent young people from becoming engaged in farming (Gale, 2003). To investigate this argument, null hypothesis H_{04} and alternative hypothesis H_{A4} were formalized as follows.

H_{04}: Farm entry barriers are not the cause of low likelihood of farm entry.
H_{A4}: Farm entry barriers are the cause of low likelihood of farm entry.

Finally, I argue that even though farming conditions or farm entry barriers do not hinder farm entry, they cancel out the effect of farm entry policy. To investigate this argument, null hypothesis H_{05} and alternative hypothesis H_{A5} were formalized as follows.

H_{05}: Farming conditions and farm entry barriers do not cancel out the effect of farm entry policy.

H_{A5}: Farming conditions or farm entry barriers cancel out the effect of farm entry policy.

1.2.2 Farm exit

Why does agricultural structural adjustment policy not stop the trend towards an increase in the number of old farmers?

As in the case of farm entry, I argue that this is due to the low probability of farm exit by older farmers, the incompatibility of farm exit policy, competitiveness policy, and rural development policy, and the fact that farming conditions and farm exit barriers also hinder the

exit of old farmers.

First, I argue that older farmers are not more likely to exit farming than younger ones, and therefore agricultural structural adjustment policy which is intended to induce old people to exit from farming does not work. On the basis of the relationship between age and farm exit statistics, some researches have argued that farm exit could be facilitated by lowering the upper age limit at which it is possible to apply for the early farm exit program, because farmers are less likely to exit from farming as they get older (Väre, 2006; Pietola et al., 2003). To investigate this argument, null hypothesis H_{01} and alternative hypothesis H_{A1} were formalized as follows.

H_{01}: Older farmers are more likely to exit from farming.

H_{A1}: Older farmers are not more likely to exit from farming.

Second, I argue that either farm exit policy does not contribute to farm exit, or incompatibility between farm exit policy, competitiveness policy, and rural development policy cancels out the effect of farm exit policy. For example, competitiveness policy, which aims to increase the profitability of farming by farmland consolidation and improvement of farming infrastructure, could induce old farmers to stay farming. And, rural development policy too could make old farmers stay farming if it gives them another source of income by making it possible to have a non-farm job as well as a farm. To investigate this argument, null hypothesis H_{02} and alternative hypothesis H_{A2} were formalized as follows.

H_{02}: Farm exit policy contributes to farm exit, and competitiveness policy and rural development policy do not cancel out the effect of farm exit policy.

H_{A2}: Farm exit policy does not contribute to farm exit, or competitiveness policy or rural development policy cancels out the effect of farm exit policy.

Third, I argue that farming conditions hinder farm exit. If old farmers can get farming income and government subsidy for as long as they farm, they can use this to delay farm exit (Kang, 2007). To investigate this argument, null hypothesis H_{03} and alternative hypothesis H_{A3} were formalized as follows.

H_{03}: Farming conditions are not the cause of low likelihood of farm exit.
H_{A3}: Farming conditions are the cause of low likelihood of farm exit.

Fourth, I argue that farm exit barriers hinder farm exit. Old farmers have to continue farming, even though they want to exit, if they cannot overcome farm exit barriers such as the absence of successors (Kang, 2004). To investigate this argument, null hypothesis H_{04} and alternative hypothesis H_{A4} were formalized as follows.

H_{04}: Farm exit barriers are not the cause of low likelihood of farm exit.
H_{A4}: Farm exit barriers are the cause of low likelihood of farm exit.

Finally, I argue that even if farming conditions or farm exit barriers do not hinder farm exit, experience of one of or more of them cancels out the effect of farm exit policy. To investigate this argument, null hypothesis H_{05} and alternative hypothesis H_{A5} were formalized as follows.

H_{05}: Farming conditions and farm exit barriers do not cancel out the effect of farm exit policy.
H_{A5}: Farming conditions or farm exit barriers cancel out the effect of farm exit policy

1.3 Justification for the research

With the rise of the issues of market liberalization and economic development, agricultural structural change, especially farm entry and farm exit, and agricultural structural adjustment policy have attracted the interest of farmers, government, and rural communities for the past

few decades.

First of all, the phenomenon of farm entry and farm exit has been a notable cause of structural change (Väre, 2007; Gale, 2003; Pietola et al., 2003; Kimhi and Lopez, 1997) and it is believed to be a way of improving the competitiveness of the farming industry (Gale, 2003; Pietola et al., 2003; Ehrensaft et al., 1984; Bollman and Steeves, 1982). Further, it is regarded as a path to securing family farms and keeping them going (Lobley, 2010; Giraud, 2004; Errington 2001; Kimhi and Lopez, 1997; Kimhi, 1994; Bohlje, 1973), despite the decline in the tradition of the oldest son taking over the farm (Rossier and Wyss, 2006), and it also affects the viability of the rural community (Gale, 2003; Pietola et al., 2003).

In addition, agricultural structural adjustment policy, which is established to make agricultural structure more competitive and efficient (Happe, 2004) by taking a positive role in agricultural and rural problems (Antón, 2008; Bai et al., 2007; Blandford and Hill, 2006; Hill, 2005), is one of the major concerns of many countries, although it has sometimes been argued that agricultural structural policy has deterred structural adjustment by distorting market factors in agricultural production (Happe, 2004; OECD, 1995; Goddard et al., 1993).

Despite the importance of both agricultural structural adjustment policy and farm entry and exit to the farming industry, as well as to rural areas, there is not much research to be found on them. In addition, agricultural structural adjustment policy and farm entry and exit have not been dealt with simultaneously in research. This makes it difficult for stakeholders to understand and evaluate how agricultural structural adjustment policy affects farm entry and exit, even though the Korean government has been trying to facilitate farm entry and exit through agricultural structural adjustment policy since the 1990s.

One of the reasons why studies of the effect of agricultural structural adjustment policy on

farm entry and exit have not been the centre of attention for research could be that the scope of agricultural structure and that of agricultural structural adjustment policy are so broad that only partial aspects of them, such as the relationship between the early farm exit program and farm exit, have been reported on, and even then this information may have been produced indirectly, as in the case of Väre (2006) and Pietola et al. (2003).

But, this research suggests a way of directly and comprehensively solving the problem of why agricultural structural adjustment policy does not stop the decrease of young farmers and the increase of old farmers by applying findings from earlier studies by Väre et al. (2006) on the relationship between the personal characteristics of farmers and farm entry and exit, and by Ajzen and Fishbein (1980) and Ajzen and Cote (2008) on the principle of compatibility between attitudes and behavior.

In addition, findings from this research will be applied to improve the effect of agricultural structural adjustment policy on farm entry and exit by helping to explain dynamic farm entry and exit mechanisms in which personal characteristics, farming conditions, farm entry and exit barriers, and agricultural structural adjustment policy are interrelated.

1.4 Methodology

This research aims to examine the effects of the personal characteristics of farmers on farm entry and exit in relation to farming conditions, agricultural structural adjustment policy (farm entry and farm exit policy, competitiveness policy, and rural development policy), and farm entry and exit barriers, in order to test the hypotheses and answer the research question presented in Section 1.2.

The framework of this research is based on theories about the relationship between the

personal characteristics of farmers and farm entry and exit (Väre, 2006) and the relationship between attitudes and behavior (Ajzen and Cote, 2008; Ajzen and Fishbein, 1980). The relationships between the above variables are represented in a multiple mediation effect analysis model in which personal characteristics are independent variables, attitudes to farming conditions, attitudes to agricultural structural adjustment policy, and attitudes to farm entry barriers (farm exit barriers) are mediators, and farm entry (farm exit) is a dependent variable.

Considering the type of inquiry and the data required, as described above, a survey research method was adopted which would make it possible to collect data on social phenomena which cannot be directly measured, such as attitude and belief. It was also necessary to examine relationships between the variables and to generalize these across the population, which was made possible by using statistical analysis techniques. Structured questionnaires were utilized to obtain data, and the questionnaires were administered in personal interviews rather than by mail or through a telephone survey, because this method is appropriate for old people and has a higher response rate than the others. Open-ended interviews were also conducted to complement the quantitative data.

The relationships between variables in the multiple mediation effect analysis model were analyzed using the macro devised by Hayes (2009) which conducts multiple linear regression analysis, binary logistics regressions analysis, and bootstrapping. More detailed methodological concerns about data collection and data analysis, such as sampling method, scale, measurement, questionnaires, and multiple mediation effect analysis, are explained in Chapter 6.

1.5 Outline of this research

This thesis is developed as follows.

Chapter 2 reviews earlier theoretical and empirical studies on the factors which affect farm entry and exit and the relationships between these. The rationales for the relationships are also reviewed. Then the contribution and methodological limitations of the studies in verifying the effect of farm entry and exit policy on farm entry and exit are pointed out.

Chapter 3 outlines agricultural structural adjustment policy and agricultural structural change in Korea since the 1960s, focusing on the evolution of farm entry and exit policy. And paths through which agricultural structural adjustment policy affects farm entry and farm exit are explored.

Chapter 4 evaluates the effect of farm entry and exit policy on the entry of prospective farmers and the exit of old farmers from both micro- and macro-economic points of view using secondary data from the Ministry of Agriculture and Forestry and the National Statistics Office. On the basis of the result, there is an evaluation of how well the results were explained by logical inference in Chapter 3, and those results are compared with cases from foreign countries. The Chapter ends with an indication of why further research is needed.

Chapter 5 introduces a novel concept, the assigning of a type to farmers, which previous studies have overlooked. In addition to the demographic and socio-economic characteristics of farmers, which have generally been seen as influential factors in farm entry and exit in most previous studies, personality type is another kind of factor which potentially affects farm entry and exit. Type is derived from a utility maximization model which reflects the economic, social, and geographical conditions of farming.

Chapter 6 provides the methodological basis for this research and describes a logical method

of solving the research question from a different perspective to that of previous farm entry and exit studies. This chapter deals with research philosophy, measurement, scale, sampling techniques, data collection methods such as face-to-face survey, and a data analysis method: multiple mediation effect analysis.

Chapter 7 gives the results of data analysis and an interpretation of these. The total effect of farmers' personal characteristics on farm entry and exit, the direct and indirect effects of these characteristics, through attitudes to farming, attitudes to agricultural structural adjustment policy, and attitudes to farm entry and exit barriers, are estimated. And on the basis of the results, the five hypotheses are verified.

Chapter 8 draws a conclusion from this research by giving an answer to the research question. And the theoretical implications for farm entry and exit studies and the practical implications for improving the effect of agricultural structural adjustment policy are pursued. Finally, the limitations of this research and directions for further studies are suggested.

1.6 Definitions

The concepts which are used in this study are defined as follows.

Agricultural structure

Agricultural structure in a broad sense includes the shapes of farming infrastructures, farming management, farm entry and exit, farming production factors, and farming production methods, all of which are included in the definitions of Penn (1979), Marsh (1977), Kuramochi (1994), and Harris (2008b). However, agricultural structure in a narrow sense means the combination of farmers and farmland (Kim, 2002), as in the studies of Seo (1993), and Kim and Lee (2004). In this research, the latter definition of agricultural structure is the

one used.

Agricultural structural adjustment

Agricultural structural adjustment refers to the process of macro- and micro-economic change in agricultural sectors (Harris, 2008b; OECD, 1996). From a macro-economic point of view, agricultural structural adjustment means redistribution of economic resources among sectors, and from a micro-economic point of view, it is related to decision-making by farmers about the use of input resources in their business (Harris, 2008b: Kim et al., 2009; Bascou et al., 2004). In this research, agricultural structural adjustment is defined from the micro-economic point of view.

Agricultural structural change and agricultural structural adjustment

The term agricultural structural adjustment is related to the dynamic behavior of people, but agricultural structural change refers to the phenomena which are induced by those behaviors (Harris, 2008b).

Agricultural structural adjustment policy

Agricultural structural adjustment policy is mainly about adjustments to the use of human resources (Cahill and Hill, 2006). In this research, agricultural structural adjustment policy is defined as government intervention to bring about agricultural structural change or facilitate the agricultural structural adjustment process in relation to human resources. According to the agricultural structural improvement plan of 1991, agricultural structural adjustment policy is divided into three policies: farm entry and farm exit policy; competitiveness policy; and rural development policy (policy for the creation of non-farm jobs and the improvement of living conditions in rural areas). And policy is used as a super-ordinate concept which comprehends

measures like programs and projects (Langbein et al., 2006).

Prospective farmers, farm entry, old farmers, and farm exit

The term prospective farmers refers to young people who are aged under 35 and who attend agricultural schools; and farm entry refers to prospective farmers starting farming independently, regardless of the size of their farm and what they farm. Meanwhile, the term old farmers refers to people who are aged 60 and over, and farm exit means old farmers leaving commercial farming.

Farming conditions

Farming conditions include size of farming income, social standing of farmers, and quality of life in rural areas.

Personal characteristics

Personal characteristics refer to demographic and socio-economic characteristics and type of personality.

1.7 Limitations of scope and key assumptions

The research elucidates why agricultural structural adjustment policy does not stop the tendency in Korea for the number of young farmers to decrease and the number of old farmers to increase.

However, this research applies only to farm entry by young people who are currently attending agricultural schools and farm exit by old farmers who are aged 60 and over. The research also deals with farm entry and exit separately, and therefore the results cannot be

expanded to cover farm transfer between generations. Geographically, the research focuses on South Korean territory, but it does not include Cheju Island.

The following assumptions have been made. First, both old farmers and prospective farmers know about farming conditions and farm entry and exit barriers, and they also have a precise understanding of agricultural structural adjustment policy. Second, respondents to the questionnaires have honestly and accurately answered the questions in those questionnaires. Finally, the effects of agricultural policies other than agricultural structural adjustment policy are taken as constant.

1.8 Summary and conclusion

This introductory chapter has outlined the basis for the research by briefly introducing a research framework which includes research background, research question and hypotheses, methodology, definition of concepts, and delimitation of scope and key assumptions. In Section 1.1, the research background was explained by emphasizing the importance of the relationship between structural change, that is farm entry and exit, and agricultural structural adjustment policy, as well as the lack of relevant research. In Sections 1.2 and 1.3, the research question was raised and five hypotheses were formulated and justified. The research methodology, a survey method, was introduced in Section 1.4. Finally, limitations of time and place and of some key assumptions about research objectives were described in Section 1.7 in order to clarify the scope of this research. On the basis of these foundations, the following chapters will develop this research in more detail and more completely.

CHAPTER 2

REVIEW OF EARLIER STUDIES

2.1 Introduction

In the previous chapter, the background, research questions and hypotheses for this research were described, and the following three arguments were given as a point of departure. First, that the personal characteristics of prospective and old farmers affect farm entry and farm exit. Second, that farming conditions, agricultural structural adjustment policy, and farm entry and farm exit barriers intervene in the farm entry of prospective farmers and farm exit of old farmers. And third, that the effect of farm entry policy or farm exit policy is offset by competitiveness policy and rural development policy, or by farming conditions and farm entry and exit barriers.

This chapter aims to investigates not only the kinds of personal characteristics, that is demographic and socio-economic characteristics, that farmers have, and their effects on farm entry and exit, but also the kinds of external circumstances, such as farming conditions, agricultural structural adjustment policy, and farm entry and exit barriers, that affect farm entry and exit, as these have been presented in previous studies. This is done in order to produce a better understanding of how these variables are related to farm entry and exit and how they are interrelated; and rationales for the relationships are also presented.

This chapter is developed as follows. Section 2.2 deals with the trend revealed by studies of the mobility of labor between economic sectors. In Section 2.3, the research methods of earlier studies are introduced, and then the effect of personal characteristics and external circumstances on farm entry and exit, and farm transfer are discussed in Section 2.4. Finally,

the contribution made by the studies on farm entry and exit are described in Section 2.5, and the problems and limitations of the studies are identified in Section 2.6.

2.2 The trend shown by studies on farm entry and exit

2.2.1 Farm entry and exit in inter-sector studies

Why do old farmers quit or continue farming? And why do young people enter or exit farming? Studies on these phenomena, that is job selection behaviors by old and young people, can present an economic, a social or a psychological perspective on these behaviors, and these different perspectives prompt different approaches to the motives for farm entry and exit. However, it is studies which are conducted from economic point of view that are the focus of this research.

Economic studies of the movement of workers between two industries, for example between agriculture and other industries, since the 1950s (Ranis and Fei, 1961; Jorgensen, 1961; Sjaastad, 1962; Becker, 1962; Jorgensen 1967; Todaro, 1969**;** Stark, 1982; Stark and Lucas, 1988), can be regarded as the origin of studies on farm entry and exit. These studies deal with the movement of farm workers or rural people, and this movement is considered as one of labor supply from the perspective of economic development. Studies since the 1990s, for example those of Kimhi (1994) and Foltz (2004), can be regarded as contemporary theoretical studies on the farm entry of prospective farmers and farm exit old farmers.

Modern theoretical studies can be divided into four categories according to farm workers' motives for movement, which are: income differential; investment in human capital; expected income maximization; and family utility maximization.

First, the studies of Ranis and Fei (1961) and Jorgensen (1961) consider wage differentials as

a motive for the movement of labor between economic sectors. That is, they consider how higher wages in the non-agricultural sector induce farmers to enter that sector as a perfect example of market forces.

Second, the studies of Sjaastad (1962) and Becker (1962) consider the motive for movement as investment in human capital. That is, the movement of labor is a kind of investment, like on-the-job training, schooling, information services, and improvements in the health service, to increase the productivity of human resources, and the decisions that lead to movement are made according to benefit-cost analysis (Sjaastad, 1962) or earning maximization (Becker, 1962).

Third, the studies of Todaro (1969) established the theory of an economic behavioral model. Torado's analysis was based on the theory of expected income maximization, and it implied that a rural worker would move from a rural to an urban area if the expected income in the urban area were bigger than that in the rural area, even though he might not be able to get a job immediately.

Finally, Stark (1982) and Stark and Lucas (1988) considered migration from rural to urban areas as the result of a contract made among family members. This theory adopts a family-level approach and movement is seen as being undertaken to maximize family utility. Following this, more recent research by Kimhi (1994) has modeled farm entry and farm exit on the basis of maximization of the current value of a farm family's income; and research by Foltz (2004) has theorized farm entry and exit on the basis of sunk costs.

These studies shed light on structural change between sectors, and they also form the basis of a model which investigates the effect of personal characteristics and other external circumstances on farm entry and exit.

2.2.2 Farm entry and exit studies within the farming industry

Studies on farm entry and exit can be classified into several categories, as summarized in Table 2.1, according to their position in following dimensions: 1) Analysis level: individual or family or region or country 2) Subject: farm entry or farm exit or farm transfer 3) Research area: process or result 4) Motive: internal or external 5) Perspective: natural change or artificial reform 6) Data: ex-ante or ex-post.

First, studies on farm entry and farm exit were done on three levels: micro, meso, and macro (Mann and Mante, 2004). A micro-level approach (Kimhi and Nachlieli, 2000; Stiglbauer and Weiss, 2000; Weiss, 1999) looks at individual farm families; a meso-level approach (Huffman and Evanson, 2001) looks at regions; and a macro-level approach (Mann and Mante, 2004) looks at a whole country as an analysis unit. When researchers deal with farm entry and farm exit, they usually adopt family farms as an analysis unit. This is because a family farm has traditionally been the main unit in farming and this type of farm usually has a significant portion of farmland (Giraud, 2004).

Second, the subject of previous research studies was one or more of the following: farm transfer (Väre, 2007; Rossier and Weiss, 2006; Stiglbauer and Weiss, 2000; Kimhi, 1994), farm exit (Foltz, 2004; Glauben et al., 2003; Pietoal et al., 2003; Goetz and Debertin, 2001; Kimhi and Bollman, 1999), and farm entry (Mann and Mante, 2004; Kimhi and Nachlieli, 2000). The majority of researchers concentrated on farm transfer or farm exit. Accordingly, researchers targeted old farmers rather than prospective farmers or those taking over farms. This is because researchers took the family farm as the analysis unit and assumed that intergenerational transfer was automatically accomplished by an old farmer deciding to transfer the rights in a farm to one or more successors within the family. In this process, the

intentions of the children were not considered significant. As one of the characteristics of a family farm is intergenerational transfer between farmers and their children, researchers' main concern was with the transfer of farmland rather than with retirement and the subsequent closing down of farms.

Third, either cause and effect or the process of farm entry and exit were the main areas for research. The majority of researchers concentrated on investigating the impact of farmers' characteristics, their families, and their farmland on farm transfer or farm entry or exit. Meanwhile, some researchers (Errington, 2001; Blanc and Perrier-cornet, 1993; Keating and Munro, 1989) who approached the micro-process of farm transfer concluded that farm succession proceeded by stages from co-working between the generations to transfer of ownership in its entirety. To be specific, although there were some differences between research results, in general farmers followed a common pattern in handing over first decisions on matters of daily concern, then longer-term planning for the operating of the farm, then the employment of workers, and, finally, financial affairs (Errington, 2001). Keating and Munro (1989) found that farmers who decided to retire from farming reduced working time and then transferred their right to run the farm and their proprietorship of it. But this pattern cannot be applied when farmers have to decide to transfer their farmland involuntarily.

Fourth, motives for farm entry and farm exit can be classified into internal and external ones. Characteristics of farmers, farmland and family circumstances belong to the former; and variables which are related to macro-economics and policy interventions belong to the latter. The majority of studies have focused on internal variables (Rossier and Weiss, 2006; Väre, 2006; Glauben et al., 2003; Kimhi and Nachlieli, 2000; Stiglbauer and Weiss, 2000; Kimhi and Bollman, 1999; Kimhi 1994) rather than external variables (Foltz, 2004; Pietola et al.,

2003; Barkely, 1990).

Fifth, the purpose of research studies can be divided into two categories. The first is to analyze the cause and effect of farm entry and exit (Rossier and Weiss, 2006; Väre, 2006; Glauben et al., 2003; Kimhi and Nachlieli, 2000; Stiglbauer and Weiss, 2000; Kimhi and Bollman, 1999; Kimhi, 1994); and the second is to evaluate the performance of structural reform by governmental intervention (Foltz, 2004; Pietola et al., 2003), although studies in the former category also provide some suggestions for agricultural structural reform.

Finally, studies on farm entry and exit have usually been done on the basis of two kinds of data: ex-ante data (Mann, 2007; Rossier and Weiss, 2006); and ex-post data (Väre, 2006; Glauben et al., 2003; Kimhi and Nachlieli, 2000; Stiglbauer and Weiss, 2000; Kimhi and Bollman, 1999; Kimhi, 1994). Panel data is an example of ex-post data; and survey data is an example of ex-ante data. Most of the studies were done on the basis of the former.

Table 2.1 Classification of farm entry and exit studies

Level	Subject	Area	Motive	Data
Individual	Entry	Cause/Effect	Internal	Ex-ante
Farm Household	Exit	Process	External	Ex-post
Region	Transfer			
Country				

(Source: Own table)

2.3 Research methods used in earlier studies

Earlier studies on farm entry and exit, such as whether or not prospective farmers enter farming, or whether or not old farmers exit farming, the timing of farm entry and exit, and the pattern of farm entry and exit, were predominantly conducted using an econometric approach, which can be classified as a quantitative research method, although a mixed method was also

used on rare occasions for this kind of research.

First, secondary data analysis (Väre, 2007, 2006; Foltz, 2004; Findeis and Swanminathan, 2003; Glauben et al., 2003; Pietoal et al., 2003; Väre and Lansik, 2003; Goetz and Debertin, 2001; Kimhi, 2000; Stiglbauer and Weiss, 2000; Kimhi and Bollman, 1999; Kimhi 1994; Pfeffer, 1989; Gale, 1993; Weiss, 1999) is one of the most frequently used research method. In secondary data analysis, data such as farmers' individual, family and farmland characteristics, whether they are going to exit their farm or not, and their retirement choices, are obtained from the national statistics office or the farmers' insurance institute.

Second, a farm survey (Mann, 2007; Rossier and Weiss, 2006; Glauben et al., 2004; Tietje, 2004; Findeis and Swanminathan, 2003; Errington and Lobley, 2002; Errington, 2001; Kimhi and Nachlieli, 2001; Kimhi and Lopez, 1999; Keating and Munro, 1989) is another frequently used method in farm entry and exit studies. Researchers obtain data such as individual characteristics, anticipated timing of farm exit, and whether or not a farm will be handed over to successors, by questioning farmers and prospective farmers.

The data in secondary data analysis or in a farm survey are analyzed by econometric techniques such as a probit model (Väre, 2007; Foltz, 2004; Glauben et al., 2004; Tietje, 2004; Findeis and Swanminathan, 2003; Väre and Lansik, 2003; Pietola et al., 2003; Goetz and Debertin, 2001; Kimhi and Nachlieli, 2001; Kimhi and Bollman, 1999), a logit model (Hennessy, 2002; Kimhi, 2000; Stiglbauer and Weiss, 2000; Pfeffer, 1989), a duration model (Väre, 2007, 2006), simulated maximum likelihood (Väre, 2007; Väre and Lansik, 2003) or a regression model (Mann, 2007; Väre, 2006; Foltz, 2004; Mann and Mante, 2004; Glauben et al., 2003; Goetz and Debertin, 2001; Stiglbauer and Weiss, 2000; Kimihi and Lopez, 1999; Kimhi,1994; Gale, 1993).

Third, Mann (2007) used a qualitative approach with a case-oriented method of objective hermeneutics to investigate farm succession procedures in family farms.

The final method of analyzing data is a mixed method. Rossier and Wyss (2006) collected data from a self-administered survey of future farm entry and exit decisions, and a large number of focus group interviews were also conducted to enable the researchers to interpret the data.

2.4 Findings

Farm entry and exit is divided into farm entry and farm exit; and farm exit is divided into farm exit and farm transfer between generations, a distinction which is based on the criterion of whether or not farm succession takes place between family members.

There may be no need to differentiate farm transfer from farm exit, that is the closing down of farming or the selling or leasing of farmland, because, especially in family farms, the retirement of old farmers means the farm is transferred between family members. But it may be more sensible to draw a sharp line between them, because whether there is succession between family members or not can affect farm exit. Further, this is a better way of proceeding if old farmers have difficulty in designating a younger member of the family to succeed them with the decline of primogeniture.

2.4.1 Farm entry

2.4.1.1 Demographic and socio-economic characteristics and their effects

Although the entry of young people into farming is very important for both farmers and their children, this was not what most researchers were interested in (Stiglbauer and Weiss, 2000).

Studies on farm entry were not conducted to any great extent, except in a few cases, like that carried out by Rossier and Wyss (2006). The reason for this seems to be related to the implicit assumption that intergenerational transfer is dependent on the will or intention of farmers, rather than that of their successors in the family farm. But the decrease of young people's entry into farming means the collapse of the family farm (Gale, 2003,) and relations between old farmers and their children are not always consistent (Väre, 2007). So, young people's entry into farming needs to be analyzed separately from farm transfer.

Meanwhile, demographic factors (Gale, 1993), the timing of succession (Väre, 2007), and the degree of interest in farming (Rossier and Wyss, 2006) are regarded as the motives which affect farm entry. And land-related factors like farm size are the most frequently cited ones. The effects of demographic and socio-economic characteristics on farm entry are as follows.

First, the bigger the farm, the more probability there is of those succeeding to it selecting farming as their job, for economic reasons (Rossier and Wyss, 2006; Hennessy, 2002). The argument that children do not want to take over a small farm if the farm cannot make sufficient income (Gasson et al., 1988) is another example of this. However, it is also argued that active entry into farming can take place in farming households which operate small farms (Ehrensaft et al., 1984).

Second, if young people have an interest in farming, this tends to offset the lack of sufficient income to live well on (Rossier and Wyss, 2006).

Third, formal education is negatively associated with farm entry (Hennessy, 2002).

Finally, a prospective successor will seek a non-farm job if the expected succession does not take place at a suitable time (Väre, 2007).

2.4.1.2 External circumstances and their effects

Income differential between industries (Gale, 2003) and the size of income that can be expected from farming (Gasson et al., 1988) are regarded as the most influential factors which affect farm entry. And the price of agricultural products (Pietola et al., 2003), start-up expenses, access to financial services, and the size of the rural population (Gale, 2003) are examples of external variables which affect farm entry.

First, the fact that a larger income can be earned in other industries is seen as a cause of the low rate of entry into farming (Gale, 2003), because young people are more likely to respond to the income differential between farming and other industries than older farmers.

Second, Pietola et al. (2003) argued that lower prices for farm produce also hindered prospective farmers from entering farming, and this had a negative effect on the maintenance of the rural population.

Third, farm entry barriers seem to feature in research more often than factors facilitating farm entry. The size of start-up costs and limited access to financing discourage prospective farmers from entering farming (Gale, 2003).

Finally, from a socio-cultural point of view, a decrease in the rural population functions as a cause of low entry into farming (Gale, 2003).

2.4.2 Farm exit

2.4.2.1 Demographic and socio-economic characteristics and their effects

From a micro economic point of view, what makes farmers exit from farming or transfer their farmland to someone else? From the perspective of farm management, it may be done for the

purpose of saving tax (Boehlje and Eisgruber, 1972) or spreading the risks of farm management (Pesquin et al., 1999; Guinnane, 1992). It is also a way of providing farmers with a livelihood in their old age (Pesquin et al., 1999) and a way of providing for their children (Becker and Murphy, 1988), so that there is optimal distribution of income between the generations (Rosenzweig and Wolpin, 1985).

So, what personal characteristics facilitate or delay the point at which a farmer leaves farming? The demographic and socio-economic characteristics of farmers can be categorized into those of the farmers themselves, those associated with their families, and those associated with their farmland.

First, the important characteristics of farmers themselves are their age, their farming career, their farming income, any off-farm income, the income they anticipate in the future, the possibility of an early retirement pension, and their old age pension (Väre 2007), the level of technology on their farm (Foltz, 2004), their intentions for the future (Keating and Munro, 1989), the amount of time and money they have (Giraud, 2004), the location of their residence (Kimhi and Bollman, 1999), and the quantity of information they have access to (Giraud, 2004).

Second, the family characteristics that are important are the age of a spouse, the number of children the farmer has, the age of the oldest son, a spouse's expected income, a spouse's early retirement pension, and a spouse's old age pension (Väre, 2007), a spouse's off-farm work, and the circumstances of any children the farmer has (Giraud, 2004).

Finally, the motivating characteristics of farmland are farm location, type of farm products, size of cultivated area (Väre, 2007), degree of farm specialization (Kimhi and Bollman, 1999), and the current size of the farmer's capital (Foltz, 2004).

The characteristics of old farmers that affect farm exit are as follows.

First, according to researchers who adopt a life cycle theory (Gale, 1994; Kimhi, 1994; Boehlje, 1992), the main causes of farm exit are related to physical problems and farmers' desire to preserve their inheritance. Thus, the causes suggested for farm exit are loss of physical ability to work, the farmer's awareness of limitations in his ability to operate the farm, and unexpected incidents (Kimhi and Bollman, 1999).

Second, the probability of retirement without transfer of the farmland to the next generation will increase as farmers' age increases (Kimhi and Nachlieli, 2000). However, some researchers (Väre, 2006; Pietola et al., 2003) have argued that the two are in a negative relationship, while other researchers (Stiglbauer and Weiss, 2000; Kimhi and Bollman, 1999) argue that when farmers are young, the two have a negative relationship, but they have a positive relationship after farmers have passed their late thirties.

Third, income expected after retirement will facilitate old farmers' exit from farming (Pietola et al., 2003), but the old age pension may delay farm exit (Väre, 2006).

Fourth, findings suggest that farmers' off-farm income facilitates farm exit (Goetz and Debertin, 2001; Stiglbauer and Weiss, 2000; Kimhi and Bollman, 1999) or it delays farm exit (Väre, 2006; Glauben et al., 2003) or it has no impact on farm exit (Glauben et al., 2003; Kimhi and Bollman, 1999).

Fifth, old farmers who have been farming part-time will tend to exit from farming earlier (Pfeffer, 1989; Gasson, 1986). Therefore, part-time farmers are less likely to carry on farm work in the future (Pfeffer, 1989) and they are less likely than full-time farmers to persist in maintaining and developing their farmland (Weiss, 1999). However, according to Väre (2007),

part-time farming will delay farmers' retirement, and this has something to do with the argument that one of the things that causes a family farm to flourish is the possibility of diversification of income sources by family members (Schmitt, 1991).

Sixth, the extent of farmers' formal education has no significant impact on exit from farming (Stiglbauer and Weiss, 2000), nor does the extent of farming experience (Väre, 2006).

Seventh, marital status is related to farm exit. Being married induces old farmers to exit from farming (Pietola et al., 2003), whilst when they are younger it hinders them from exiting from farming (Väre, 2007; Stiglbauer and Weiss, 2000).

Eighth, higher productivity, as represented by the level of human capital of farmers and the degree of efficiency of the farm operation in stock farming, delays exit from farming (Foltz, 2004). And a large farming income in general delays farm exit (Väre, 2006).

Ninth, Väre (2006) and Rossier and Weiss (2006) argue that farmers who live in less populated areas tend to exit from farming earlier.

Tenth, whether they are employers or employees (Giraud, 2004) affects people's attitudes toward retirement and retirement age.

The family characteristics of farmers that affect farm exit as follows.

First, the number of children or family members slows down the retirement of the head of a family farm (Väre, 2006; Stiglbauer and Weiss, 2000; Kimhi and Bollman, 1999). However, Glauben et al. (2003) argue that the time of farming exit is only dependent on whether or not there are suitable successors, although it is argued that the age of the oldest son has no impact on farm exit (Väre, 2006).

Second, the older their spouses are, the more quickly farmers retire (Väre, 2006; Pietola et al., 2003).

Third, spouses' off-farm income has no impact on farm exit; and spouses' old age pension also has no impact on farming exit (Väre, 2006).

Fourth, according to Väre (2006) and Pietola et al. (2003), married farmers are likely to exit from farming earlier.

Finally, when famers and their spouses work together, this delays the farmers' retirement (Väre, 2007; Glauben et al., 2003).

The effects of the characteristics of farmland on farm exit are as follows.

First, the size of the area cultivated and the value of the farmland are inversely related to early farm exit (Glauben et al., 2003, Stiglbauer and Weiss, 2000; Kimhi and Bollman, 1999), which is coincident with the argument that their exit from farming can be earlier for those who operate small farms (Ehrensaft et al., 1984), although, the number of employees hired to work on a farm has a positive effect on farm exit. However, according to Kimhi and Bollman (1999), farm size is not the main factor determining the tendency in farm exit. Foltz (2004) also argues that the size of a stock farm, whether it is big or not, has no significant impact on the decision to exit from farming, which is consistent with the arguments of Väre (2007) and Pietola et al. (2003).

Second, the type of goods farms produce affects the tendency in farm exit (Glauben et al., 2003; Pietola et al., 2003; Stiglbauer and Weiss, 2000; Kimhi and Bollman, 1999).

Third, the tendency in farm exit differs between a populated area and a less populated area.

For example, a farm located in a less populated area tends to change hands less frequently (Rossier and Wyss, 2006). However, according to Väre (2006) and Pietola et al. (2003), the population of an area does not affect farm exit.

Finally, diversification of farming decreases the probability of exit from farming (Stiglbauer and Weiss, 2000).

2.4.2.2 External circumstances and their effects

External variables which researchers have argued affect farm exit and farm transfer can be categorized into economic, socio-cultural, and institutional ones.

First, the economic variables are price level and price variance for farming products, the financial returns available on non-farm capital, the prices, the prime lending rate (Foltz, 2004), the incentives available to old farmers for early retirement, and the price of agricultural products (Pietola et al., 2003).

Second, socio-cultural variables are the unemployment rate, population density, the population growth rate, and the number of farm households in an area (Foltz, 2004).

Finally, institutional variables are regulations governing farmland transactions (Kimhi and Bollman, 1999).

The effects of external circumstances are as follows.

First, an increase in the amount of direct payment for early retirement is not likely to change the timing of old farmers' exit (Pietola et al., 2003; Barkely, 1990); or it is likely to keep farmers in farming (Mann and Mante, 2004), instead of speeding their departure.

Second, the effect of government intervention intended to encourage old farmers to retire from farming earlier will decrease as farmers get older (Pietola et al., 2003). That is, farmers are likely to work until they reach the oldest age at which they are eligible for the pension program (Pietola et al., 2003). Therefore, extending the upper age limit at which old farmers can still be eligible for the pension program will reduce the improvement of the agricultural structure (Pietola et al., 2003).

Third, when the domestic economy is brisk, this will reduce the probability of exit from farming due to the increase in off-farm job opportunities, low financial costs, and increasing demand for agricultural products (Gale, 2003).

Fourth, a high unemployment rate has a negative effect on decisions concerning farm exit because it decreases opportunity costs and increases the number of workers available (Foltz, 2004). This is consistent with the argument that a lower unemployment rate will facilitate the exit of farmers because of the increase in opportunity costs and the wages of employees (Mann and Mante, 2004; Goetz and Debertin, 2001). However, Barkely (1990) argued that a higher unemployment rate would facilitate farm exit.

Fifth, an increase in the rural population and a high population density in rural areas are likely to facilitate the exit of dairy farmers (Foltz, 2004). However, Glauben et al. (2003), maintain that population density does not affect farming exit.

Finally, high prices for agricultural products will keep farmers in farming (Mann and Mante, 2004), and low volatility of prices will prevent ranch farm operators from exiting farming (Foltz, 2004). However, according to Pietola et al. (2003), the price of agricultural products has no influence on farm exit.

2.4.3 Farm transfer

2.4.3.1 Demographic and socio-economic characteristics and their effects

The factors which affect farm transfer are the same as those which affect farm exit (Section 2.4.2.1), and the effects of personal characteristics are as follows.

First, as farmers get older, the probability of farm transfer to another generation increases; but it starts to decrease again when the farmer reaches a certain age (Väre, 2007; Glauben et al., 2003; Kimhi and Nachlieli, 2000, Stiglbauer and Weiss, 2000; Kimhi, 1994). It has been estimated that the most likely age for a farmer to transfer a farm is the late seventies or early eighties (Glauben et al., 2003). However, according to Rossier and Wyss (2006), the age of farmers has no significant influence on farm transfer between generations. Furthermore, according to Pietola et al. (2003), it delays farm transfer.

Second, according to Kimhi and Nachlieli (2000) and Stiglbauer and Weiss (2000), the period of formal schooling a farmer has undergone has a positive relationship with farm succession, although this is the opposite of an earlier argument put forward by Kimhi (1994).

Third, the amount of farming experience farmers have had has a positive effect on farm transfer (Glauben et al., 2003; Väre, 2005). However, there are other arguments that it does not affect farm transfer (Väre, 2006) or that it has a negative influence on the timing of farm transfer (Kimhi, 1994).

Fourth, farmers who have an off-farm occupation will not be reluctant to transfer their farm to their children, for the sake of the children (Väre, 2006; Kimhi, 1994), which is the opposite of the argument of Stiglbauer and Weiss (2000). Other researchers (Väre, 2005; Goetz and Debertin, 2001; Kimhi and Nachlieli, 2000) found that whether or not farmers had an off-farm

occupation did not affect farm transfer.

Fifth, farm transfer is less likely to happen when farmers work part time (Stiglbauer and Weiss, 2000; Gasson et al., 1988).

Sixth, according to Rossier and Wyss (2006) and Kimhi and Nachlieli (2000) the off-farm income of farmers has no significant influence on farm succession.

Seventh, the size of farmers' future pension has a positive influence on farm transfer (Väre, 2007).

Eighth, farmers who have a spouse are more reluctant to transfer their farm (Väre, 2006; Stiglbauer and Weiss, 2000). Meanwhile, Glauben et al. (2003) argue that marital status has no effect on farm transfer.

Ninth, farmers' expectations of benefits from retirement facilitate farm transfer (Väre, 2006), but farmers' old age pensions have no effect on farm transfer (Väre, 2006).

Tenth, farmers' farming skills have no significant influence on farm transfer (Rossier and Wyss, 2006).

Eleventh, it was found that farmers transferred farmland to successors only when the income from farming that land decreased (Kimhi, 1994).

The family characteristics of farmers affect farm transfer as follows.

First, farmers who have more children are likely to transfer their farmland to their children earlier (Väre, 2006; Glauben et al., 2003; Stiglbauer and Weiss, 2000). Among farmers' children, those who are well educated are likely to succeed to the family farm earlier (Kimhi,

1994). However, according to Rossier and Wyss (2006) and Kimhi and Nachlieli (2000), the number of family members working on the farm has nothing to do with farm transfer.

Second, farmers who have spouses who do not have jobs will transfer their farm earlier (Pietola et al., 2003); but spouses who are working on the farm with farmers delay transfer (Glauben et al., 2003). This difference is due to the fact that farmer and spouse want to spent time together in their old age (Blau and Riphahn, 1999; Blau, 1998).

Third, farm income size and its ratio to total income are factors which affect farm transfer. A decrease in both farm income and the overall income of a farm family influence the family's decision on transfer (Väre, 2007). A farm household which earns the majority of its money from farming tends to be more accepting of farm transfer (Gasson and Errington, 1993). And when farm families' reliance on farm income for their livelihood is reduced, farm transfer becomes less likely (Weiss, 1999; Gasson and Errington, 1993).

Fourth, the amount of a spouse's expected pension and a spouse's off-farm income promote farm transfer (Väre, 2006). But, a spouse's old age pension has no effect on farm transfer (Väre, 2005).

The effects of the characteristics of farmland on farm transfer are as follows.

First, a larger farm size will increase the probability of intergenerational farm transfer (Pietola et al., 2003), which has something to do with the argument that farm transfer tends to occur in family farms which possess a large amount of farmland (Väre, 2006; Pietola et al., 2003; Kimhi and Nachlieli, 2000; Stiglbauer and Weiss, 2000; Gasson et al., 1998; Kimhi and lopez, 1997). However, Glauben et al. (2003) argue that farm size has no significant effect on farm transfer.

Second, the probability of a farm being transferred which is located in a less suitable living area is lower (Glauben et al., 2003; Stiglbauer and Weiss, 2000). However, Stiglbauer and Weiss (2000) and Pietola et al. (2003) found that farm location does not have a significant effect on farm transfer.

Third, the probability of farm transfer is different according to the different kinds of agricultural goods produced (Kimhi and Nachlieli, 2000; Kimhi and Bollman, 1999; Kimhli, 1994), which is due to the specialized human capital needed for certain agricultural products (Kimhi, 1994). However, it is also argued that the kinds of agricultural goods produced have no significant influence on farm transfer (Rossier and Wyss, 2006).

Finally, more diversified farms are more likely to be the subject of farm transfer (Glauben et al., 2003; Stiglbauer and Weiss, 2000).

2.4.3.2 External circumstances and their effects

First, a higher price for agricultural products has been said to have a positive effect on intergenerational farm transfer (Pietola et al., 2003), but Foltz (2004) argues that it delays farm transfer. Meanwhile, Foltz (2005) suggests that higher price volatility increases the probability of farm transfer.

Second, the effect of a subsidy on farm transfer has been seen differently by different researchers. Väre (2005) argues that it does not affect farm transfer; but Pietola et al. (2003) say that it promotes farm transfer.

Fourth, a high employment rate either has a positive effect on farm transfer (Foltz, 2004) or has no effect on it (Goetz and Debertin, 2001).

Finally, a high population density has been found to cause old farmers to transfer farmland earlier (Foltz, 2004; Goetz and Debertin, 2001).

2.4.4 Farm entry and exit and nationality

According to comparative studies on farm exit carried out in different countries, nationality influences the tendency of farmers to transfer their farms (Kimhi, 1994).

First, according to Kimhi and Bollman (1999), farming size has positive relationship with the probability of farm exit in Israel; but the two have a negative relationship in Canada, which is thought to be due to institutional factors like regulations on farmland transactions in Israel.

Second, the number of farmers who do not want to retire from farming and the age of retirement in America are higher than those in England, France, and Canada (Giraud, 2004). This is because high estate tax, hard working conditions, lower profits, and lack of governmental supports hinders farm transfer (Giraud, 2004).

Third, French farmers transfer the management of their farms faster than those in England and Canada, which is attributed to the attractive early retirement support system provided by the French government. Meanwhile, English farmers are reluctant to transfer management of their farms because they are more dependent on revenue from farming than those of any other country (Errington, 2001).

Finally, the proportion of farm households which hand over to family members or other successors of their own choosing is higher in England and Germany than in France, the United States, Canada, Austria, Australia, and Swiss (Lobley, 2010). Except in Austria and Australia, the age of farmers and their rate of securing successors are positively associated with each other – for example, this is the case in England, France, Canada, and Switzerland

(Lobley, 2010).

Along with these factors, differences in government intervention, the degree of dependency on farming income, farm exit barriers, and farming systems among the different countries are the causes of differences in farm exit patterns.

2.5 Contributions

Previous literature has established well-structured theories on farm entry and exit, although farmers' and prospective farmers' wishes have multi-dimensional aspects which include economic and socio-cultural ones. According to Gasson and Errington (1993) and Pfeffer (1989), farmers are human beings who pursue profit maximization, the enlargement of their farmland, the maintenance of well-established farmland, the maximization of the market value of their farmland, the continuation of independent management, and more leisure with their family, all at the same time.

Theories on the relationships between personal characteristics and farm entry and exit and between external variables and farm entry and exit help understanding of the behavior of prospective farmers and old farmers, as well as the possibility of predicting this behavior in an era of agricultural structural change. And studies on the micro-process of farm transfer reveal the dynamic process of intergenerational transfer which occurs between farmers and their successors in family farms.

These theories can be applied to explain farm entry and exit in Korea, although there are differences according to nationality. It is thought that farm family utility maximization theory could explain the mobility of rural people in the era of industrialization since the 1970s, and expected income maximization theory could be appropriate to describe structural change in

the industrialized era that followed the 1990s. In addition, many theories are helpful to explain the phenomenon of farm entry and exit in farm households. For example, the argument that farmers who have larger farms are likely to transfer their farms earlier (Väre, 2006; Pietola et al., 2003; Kimhi and Nachlieli, 2000; Stiglbauer and Weiss, 2000; Gasson et al., 1998; Kimhi and Lopez, 1997) can be applied to Korea, in that the ratio of farmers who have one or more successors is higher in farm households which cultivate a larger amount of farmland (NSO, 2008).

These factors can be applied to predict future agricultural structural changes in Korea. For example, it is anticipated that old farmers in Korea are likely to have difficulty in finding successors, due to their characteristic type of small-scale farming, and, as a result, the number of old farmers will continue to increase. This is because old farmers cannot expand their farm size enough to attract young people.

Another factor to be considered is that clear research findings can help policy makers, as one of the main stakeholders in the agricultural system, to adopt more suitable measures (Lobley, 2010). For example, if policy makers wish to induce old farmers to exit from their farms earlier through an early retirement program, the effectiveness of the program will be improved by lowering the upper age limit at which old farmers can apply for it (Pietola et al., 2003).

In the global economy, many countries are endeavoring to improve the competitiveness of their agricultural industry in order to survive in a climate of limitless competition and to reinvigorate rural areas which are suffering from severe depopulation. Fortunately, earlier studies show that government intervention can induce smooth intergenerational change between old farmers and prospective ones, which can be a way to achieve these goals. Like

these, the above research studies on farm entry and exit could be a beacon to indicate the right way to create a more competitive farming industry and a more developed rural area, if the research studies are understood and utilized correctly.

2.6 Problems and limitations

Despite the contribution of the above-mentioned studies, their findings are not sufficient to explain why agricultural structural adjustment policy, especially farm entry and exit policy, does not stop the trend towards a decrease in the numbers of young farmers and an increase in the numbers of old farmers. This is due to the following problems and limitations of the studies from a theoretical and methodological point of view.

First, the effect of agricultural structural adjustment policy on farm entry and exit has not been directly investigated. As is seen in previous studies like those of Kimhi (1994) and Väre (2006) et al., the effect of the early retirement scheme was indirectly estimated by examining the effect of farmers' demographic and socio-economic characteristic on the farm exit of old farmers. Although they argue that the age at which farmers take early retirement is one of the crucial factors which determines the effect of the early retirement scheme, and that government can facilitate farm exit by changing the age at which farmers are eligible for the program, they do not elucidate whether the early retirement program is effective or not. Therefore, these studies cannot answer the question of how agricultural structural adjustment policy can stop the trend towards a decrease in the number of young farmers and an increase in the number of older farmers.

Second, the relationship between demographic and socio-economic characteristics, external circumstances, and farm entry and exit has not been investigated. Earlier studies investigated separately the relationship between personal characteristics and farm entry and exit, and

between external circumstances and farm entry and exit. Therefore, it is still uncertain how the personal characteristics of farmers and external circumstances like farming conditions and farm entry and exit barriers work together to modify the effect of agricultural structural adjustment policy on farm entry and exit.

Third, the government intends to facilitate farm entry and exit through farm entry and exit policy, an early retirement scheme, a diversification policy and a competitiveness policy (Antón, 2008). However, earlier research studies did not estimate the effect of such policies on farm entry and exit and the relationship between them.

Finally, farm entry has been left out of the farm entry and exit studies, although it is possible that farm entry and farm exit are associated. Although most previous literature deals with intergenerational transfer, the studies focus on farm exit, with the implicit assumption that farm transfer is determined by the will of old farmers, irrespective of the will of their children. This is reflected in the argument that retirement and transfer occur at the same time in family farms (Kimhi and Lopez, 1997). However, in reality, farm exit is not always accompanied by farm entry of prospective farmers. This is partly because the responses of old farmers and prospective farmers do not always coincide. For instance, young peoples' behaviors are more responsive to the fluctuation of economic conditions than those of old farmers (Gale, 2003). When considering the above facts, it seems that farm entry and exit would be more accurately understood by investigating farm entry as well as farm exit. Because failure in intergenerational change may be due to the fact that there are few young people who want to enter farming, even if the majority of old people want to exit farming. That is, the cause of delayed farm exit is due to delayed farm entry and vice-versa.

2.7 Summary and conclusion

This chapter has reviewed earlier studies which focused on investigating factors which affect farm entry and exit, such as the demographic and socio-economic characteristics of farmers and their external circumstances, and the effects of these on farm entry and exit. Trends in farm entry and farm exit studies were briefly described by classifying them according to analysis level, study area, and kinds of data and research method used, for example, a farm survey, secondary data analysis, and mixed method, and these were described in Section 2.2 and Section 2.3. Then, the effects on farm entry, transfer and exit of farmers' demographic and socio-economic characteristics and their external circumstances were discussed in detail in Section 2.4. Although the results of previous studies help to explain the phenomena of farm entry and farm exit in Korea, and also suggest to policy makers a way of improving the effect of agricultural structural adjustment policy (Section 2.5), these studies are insufficient to answer the research question in Section 1.2, due to the methodological and theoretical problems and limitations described in Section 2.6. This implies that further research which investigates directly the effect of agricultural structural adjustment policy and examines the relationship between personal characteristics, agricultural structural adjustment policy, farming conditions, farm entry and exit barriers, and farm entry and exit is needed to answer the research questions.

CHAPTER 3

AGRICULTURAL STRUCTURE AND AGRICULTURAL STRUCTURAL ADJUSTMENT POLICY IN KOREA

3.1 Introduction

Chapter 2 looked at how the demographic and socio-economic characteristics of farmers and their external circumstances affected farm entry and farm exit, through empirical case studies carried out in countries like the United States, Canada, and Finland. As was seen in Section 2.4.4, nationality, and differences in institutions and in the intensity of agricultural structural adjustment policy, all affect farm entry and exit, which implies that a country's understanding of agricultural structural adjustment policy should be looked at in order to investigate its effect on farm entry and farm exit.

Accordingly, this chapter describes agricultural structural change and agricultural structural adjustment policy in Korea, in order to give the reader a better understanding of the channels through which agricultural structural adjustment policy affects farm entry and exit. This will provide a basis for investigating the effect of agricultural structural adjustment policy on farm entry and exit in Korea, as well as defining the relationship between personal characteristics, agricultural structural adjustment policy, farming conditions, farm entry and exit barriers, and farm entry and exit. This chapter aims to explore what the agricultural structural features of Korea are, why agricultural structural adjustment policy was established in Korea and how it evolved, and how agricultural structural adjustment policy can be expected to respond to farm entry and farm exit.

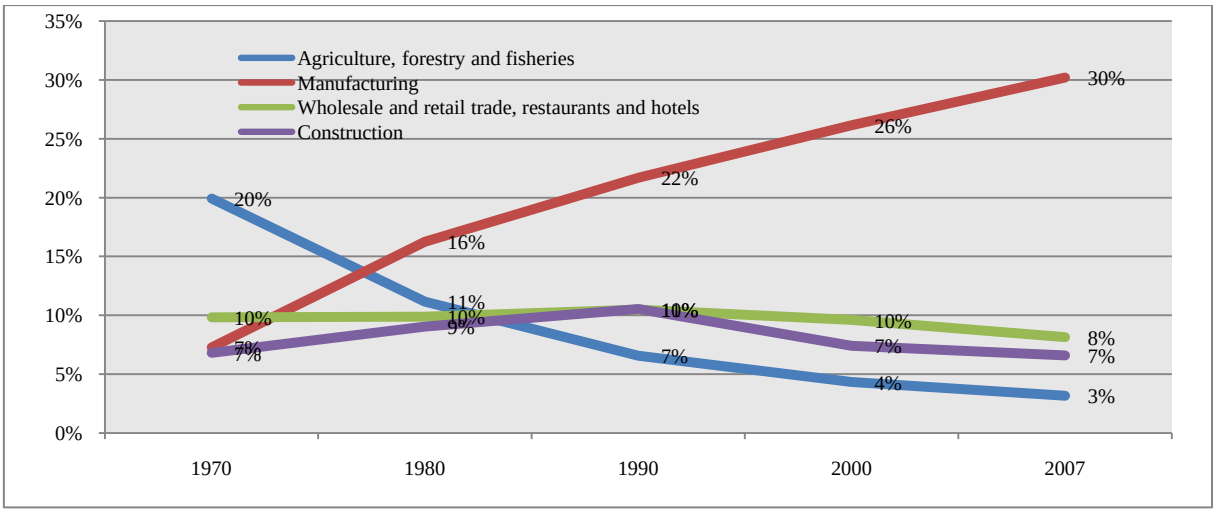
This chapter is developed as follows. First, a decline in the farming industry in Korea is outlined, and characteristics which render the agricultural structure vulnerable, such as farmers' age, farmers' education level, and farm size, are described (Section 3.2). Agricultural policy is explored by periods, in order to investigate how it has evolved and responded to changes in agricultural structure, national economic policy, and international trade policy, focusing particularly on the part that agricultural structural adjustment policy has played (Section 3.3). Then, agricultural structural adjustment policy since the 1990s is classified into three policies, and farm entry and exit policy is explained in more detail (Section 3.4). The agricultural structural adjustment policies of other countries are introduced (Section 3.5) for the purpose of comparison, and the chapter ends with a summary and conclusion (Section 3.6).

3.2 Agricultural structural change in Korea

3.2.1 The position of the agricultural industry in the national economy

With the rapid growth of non-farm sectors in Korea, the agricultural industry has undergone an abrupt decline, although until the 1960s the Korean economy was based on farming. As is seen in Figure 3.1, the agricultural industry was a leading industry in the economy of Korea, accounting for 20% of the national economy in 1970, but only 3% in 2007.

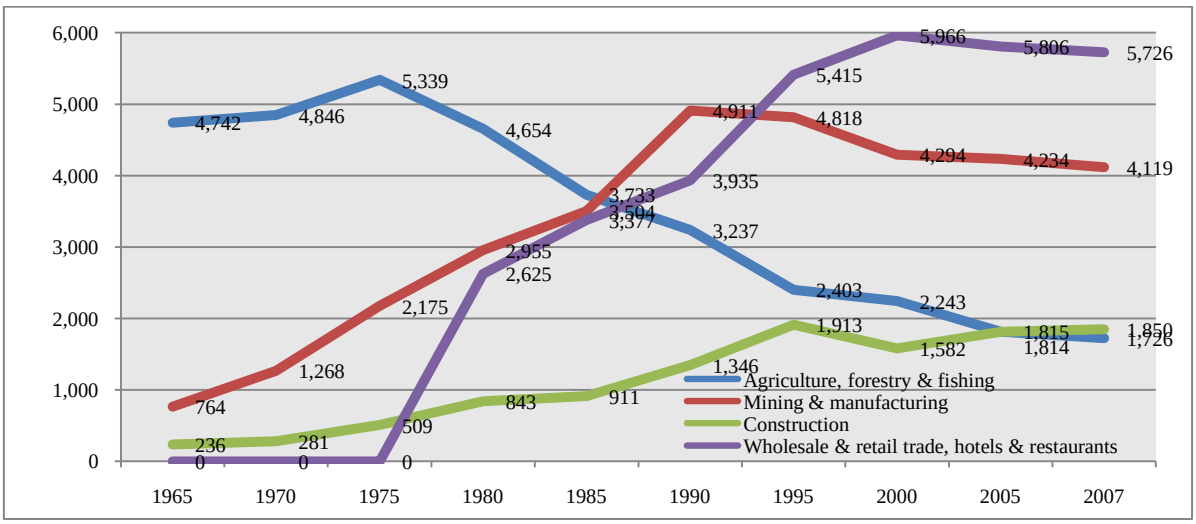
Figure 3.1 Gross National Product during 1970-2007



(Source: www.nso.go.kr)

Figure 3.2 shows the trend in employment by economic sectors. Due to industrialization and urbanization (Bedeski, 1992), the farming population decreased from 14 million in 1970, which was 63% of the total number of people in employment, to 4 millions in 2007, which was 7.4% of the total, and this trend is the opposite to those of the manufacturing and service industries.

Figure 3.2 Number of employers by economic sectors during 1965-2007



(Source: www.nso.go.kr)

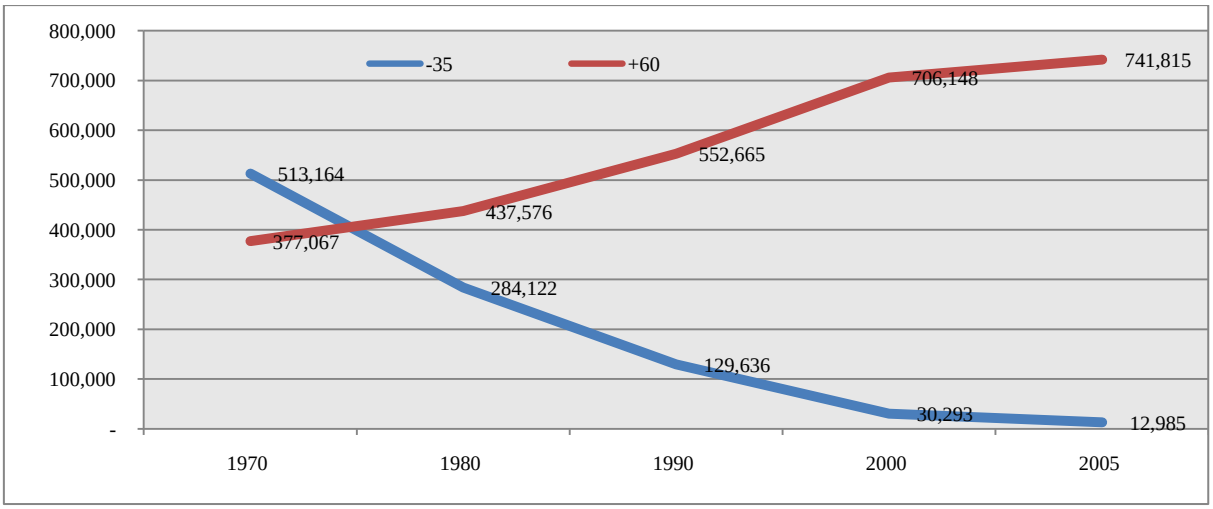
3.2.2 Changing features of the agricultural structure

Disparity between the growth rate of the farming sector and that of the non-farming sectors in Korea, due to outward migration of human and material resources, not only as a result of the industrialization of the national economy but also as a result of urbanization, has been considered to have had a negative impact on agricultural structure, for example on the age distribution of farmers (Burmeister, 1990; Cho and Joh, 1980; Park and Fullerton, 1980). The principal features of the Korean agricultural structure since 1970 are as follows.

First, one of most salient characteristics of the agricultural structure in Korea is an imbalance in age distribution between old farmers and young farmers, following a decrease in the farm population. A decrease in the farm population can be desirable from the perspective of farm households' income, because such a decrease can bring an increase in farming income per head, if capital investment in farming is able fully to substitute for farm labor. In addition to this, farm households can increase their income by helping members of the household whose labor is surplus to requirements to get non-farm jobs in an urban area. But it can be a problem if young people move to an urban area to get jobs without leaving successors who will succeed to their parent's farmland. Such a phenomenon can cause the collapse of family farms as well as of the agricultural economy (Jin, 2002) and rural community (Kim and Kim et al., 2005).

Figure 3.3 below shows the change in the numbers of those running farms, by age, from 1970 to 2005. It shows that the number of young farm operators who are aged 35 and under has sharply declined, but the number of farm operators who are aged 60 and over has increased, which is due to a national economic development policy which sacrificed agriculture and rural areas (Kim and Yu, 2003).

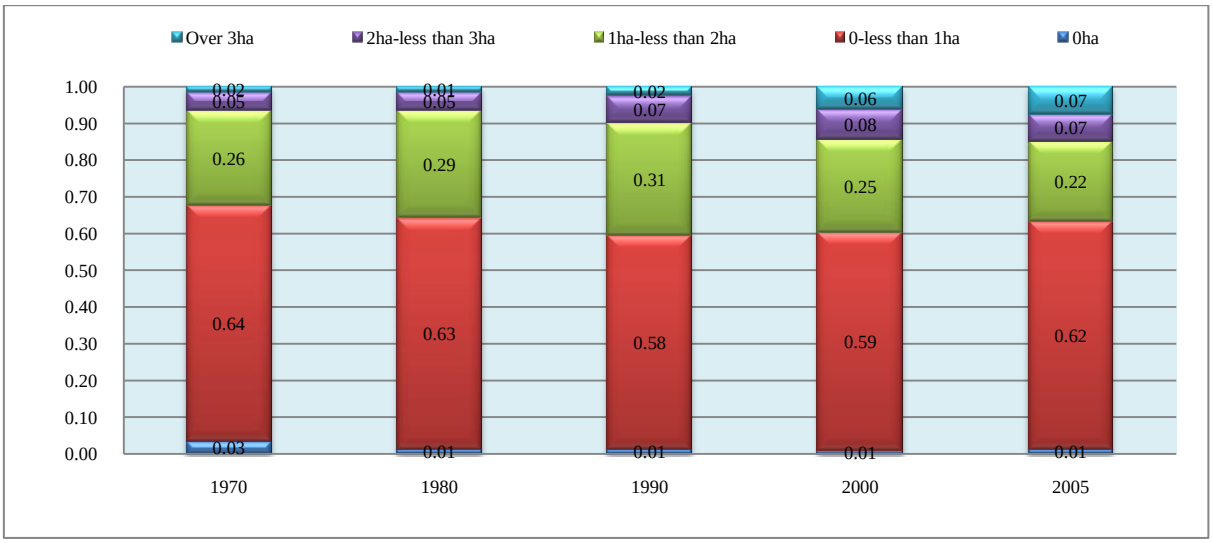
Figure 3.3 Number of farm operators by ages during 1970-2005



(Source: www.nso.go.kr)

Second, another vulnerable characteristic of agricultural structure is small-scale farming. As of 2005, the average farm size per farm household is about 1.2ha. But, farm households which cultivate less than 1ha accounted for about 60% of the total during 1970-1980, and the ratio has increased since 1990, as can be seen in Figure 3.4.

Figure 3.4 The ratio of farm households by farm size



(Source: www.nso.go.kr)

However, the dramatic feature to be observed in Table 3.1 is the increase in the number of households farming more than 3 ha which also increased their ratio of farmland per person. Those farming 2 to 3 ha show only a small drop in numbers, while those farming less land, right down to 0 ha (presumably landless tenant farmers) decrease rapidly in numbers during the period.

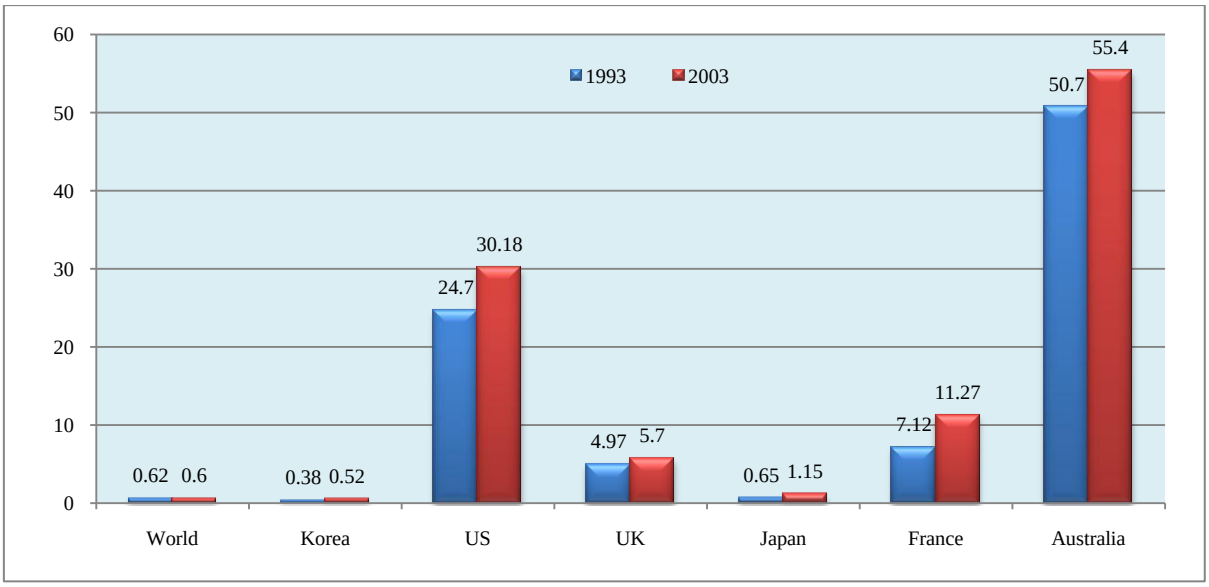
Table 3.1 Number of farm households by farm size

Scale of farming	1970	1980	1990	2000	2005
0ha	85,940	27,877	23,803	14,170	17,017
0-less than 1ha	1,597,319	1,359,277	1,027,160	819,260	788,466
1ha-less than 2ha	639,369	629,197	543,027	351,534	280,685
2ha-less than 3ha	123,391	107,559	129,510	113,790	93,295
Over 3ha	37,299	31,163	43,533	84,714	93,445
Total	2,483,318	2,155,073	1,767,033	1,383,468	1,272,908

(Source: www.nso.go.kr)

However, when comparing the average farm size per farm household among countries, it should be noted that the average farm in Korea is much smaller than in other developed and developing countries, as can be seen in Figure 3.5. In 2003, the cultivated area per head of the farm population increased to 0.52ha, which is still below the average cultivated area per head of the world farm population (=0.60) and it is far smaller than in some other countries, despite the rapid increase in cultivated area per head in Korea (see Figure 3.5 below) over the previous ten years. Only France, which increased its cultivated area per head of the farm population by 38% during same period, had as high an increase as Korea.

Figure 3.5 Average farm size per farm household by countries



(Source; adapted from Kim et al., 2007: 67p)

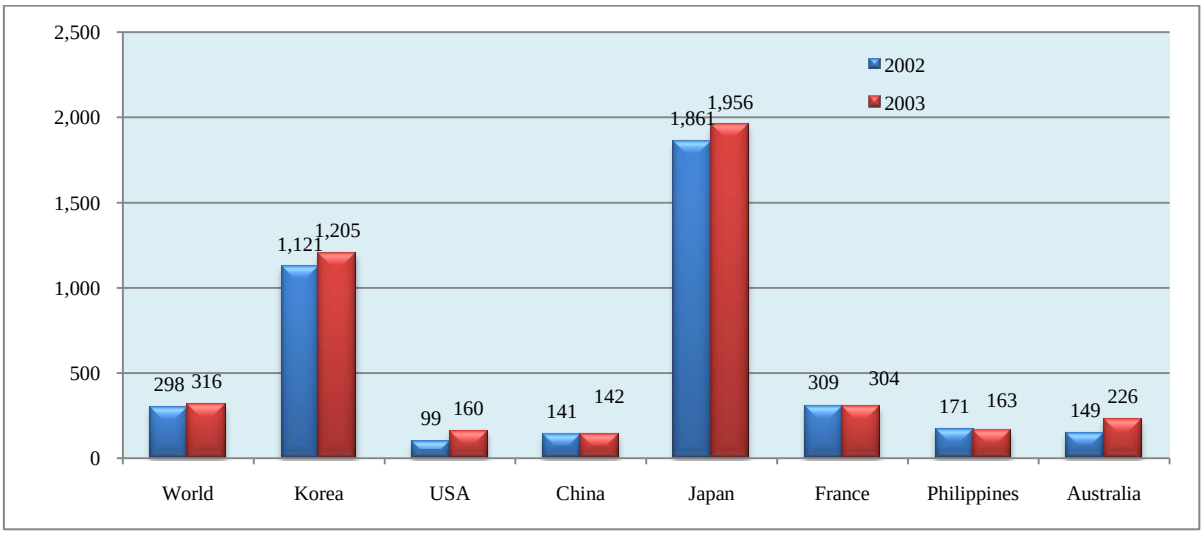
As a result of the small scale of farming, the competitiveness of the agricultural industry of Korea is much lower than that of other developed countries (Suh, 1993), because the pricing of farm products, especially rice, one of the primary farm products of Korea, is determined by the size of the area under cultivation.

Figure 3.6 shows a comparison of the price of rice among rice-producing countries. The producer price of rice in Korea was 1,205 dollar per ton in 2003, which was about four times the average price for the world. The producer price in the United States of America was 160 dollars per ton in 2003, which was about a sixth of that in Korea. And except for Japan, the producer price of rice in the other countries was only between a quarter and an eighth of the price in Korea.

Therefore, it was unimaginable that Korean rice would be able to compete with rice from other countries in the national market when the import of rice was liberalized. Furthermore, this was a serious problem, considering that income from rice accounted for over 50% of farm

household income in Korea. Therefore, Kim (2004) argued that the Korean government should levy a tariff on imported rice of as much as 400% if the national rice farming industry was to survive. Against this background, agricultural structure adjustment became an urgent issue in Korea.

Figure 3.6 Producer price of rice by countries

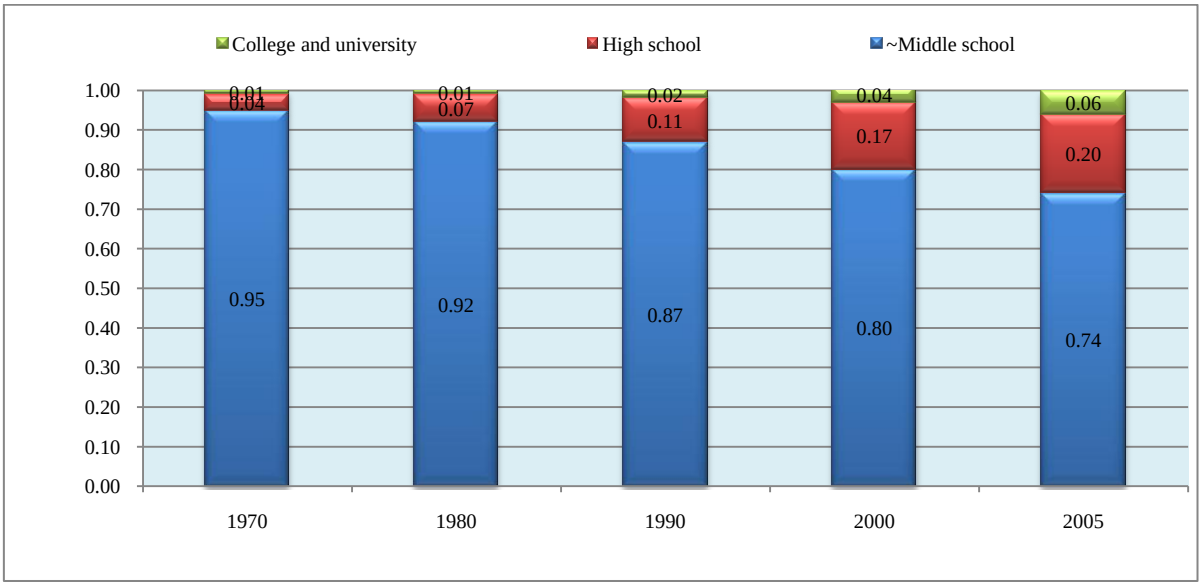


(Source: Adapted from Kim et al.(2007: pp.158 -168))

Finally, farmers in Korea have a lower level of education than Koreans who work in other sectors. As can be seen in Figure 3.7, farmers who had finished only elementary or middle school, or who had had no higher education, accounted for 94% to 99% of the farm workforce during the period 1970-2005. By contrast, the ratio of the farmers who graduated from college or university was only between 1% and 6% during the same period. However, as of the year of 2000, the percentages of the Korean people who had received the equivalent of middle school or lower, high school, college or higher were 27%, 36%, and 37% respectively (MOE, 2008). The reason that farmers have fewer years of schooling is thought to be due to the fact that Korea has a tradition of labor-intensive farming. This fact has also been regarded as an obstacle which hinders the development of high-tech farming, from the perspective of human

capital.

Figure 3.7 Number of years of schooling farmers received during the years 1970-2005



(Source: www.nso.go.kr)

3.3 Agricultural policy since 1945[1]

3.3.1 Overview

Rapid structural change and the vulnerability of Korea's agricultural structure have required a positive agricultural structural adjustment policy for farmers, the farm industry, and rural areas. In this section, the circumstances, goals, and main measures of agricultural structural adjustment policy are explained.

It is helpful to divide the period since 1945 into several categories in order to grasp the features of agricultural structural adjustment policy and compare them with one another. Kim et al. (2004) and Park et al. (2006) classified the period from 1945, when Korea regained

[1] Agricultural policy and agricultural structural adjustment policy in this section are mainly described drawing on *A Fifty-Year History of Korean Agricultural Policy* (Kim and Park et al., 1999).

independence, to the present by looking at the level of national economic development and trade liberalization. But, Huh (1993) categorizes it by agricultural development stages. It seems to us that the levels of industrialization and trade liberalization are more reasonable criteria, because agricultural policy was established to cope with changes in agricultural circumstances such as industrialization and trade liberalization. And, according to long-term agriculture and rural area development plans in 1991, 1994, 1998, and 2004, it is evident that the most influential factors which affected agriculture industry and the rural areas were industrialization and trade liberalization.

Therefore, the period from the 1945 Liberation of Korea to the present is classified into the following three stages: pre-industrialized (1945-1961); industrializing (1962-1988 – with a five-year national economic development plan starting in 1962; and a trade liberalization period (1989-) beginning when Korea graduated from the GATT BOP (Balance of Payment) clause in 1989.

3.3.2 The pre-industrialized period (1945-1961)

After the restoration of independence, one of the critical agricultural problems for Korea was low productivity due to a pre-modern farming infrastructure and small-scale farming. The tenant system in particular was criticized as a cause of small-scale farming structure, because it restricted rental and lease of farmland between farmers and non-farmers (Kim et al., 2004). Furthermore, it made farmers poorer, because the rent for a tenancy took half of the yield of that tenancy (Kim et al., 1999).

For this reason, the Land Reform Act was passed in 1949. This aimed to establish the principle that only farmers should own farmland. Since the Act, leaseholders' farmland and large landowners' farmland which exceeds 3ha have been transferred to the ownership of

small-scale farmers or tenant farmers, with compensation for the former owners. However, these policies were not implemented for the development of agriculture or to increase farm household income, but to solve the problem of a shortage of rice. So, agricultural policy has sometimes acted against farmers' own interests. For example, the price the government pays for rice has sometimes been even lower than the cost of producing it – a policy justified in the name of price stabilization.

The farming industry accounted for about 70% of the national economy in 1950 (Wang, 2005). However, it then suffered the effects of the Korean War, from 1950 to 1953. Following this, the first goal of the Korean government was to revive the impoverished national economy. Specifically, self-sufficiency in staple grains and price stabilization, as well as reform of the agricultural industry, were the problems of the national economy after the Korean War (Lee et al., 2000). So, the government's procurement of rice and land reform to solve these problems was its main agricultural policy. In addition, rural area development policy, for example village development projects, was carried out during this time, with the aim of reconstructing rural areas to form the basis of an agricultural country.

To sum up, the priority of agricultural policy was to supply the population with staple grains at a price it could afford, rather than to increase agricultural competitiveness and the income of farm households, despite the fact that there were pressing problems of small-scale farming, a feudal tenure system, and underdeveloped farming infrastructure. During this period, agricultural structural adjustment policy was not developed. Wang (2005) considered this to be a period when there was an absence of agricultural policy; and Kim et al. (2004) described agricultural policy during this period as "deterrent agricultural policy".

3.3.3 National economic development plans (1962-1988)

3.3.3.1 In the 1960s

In the 1960s, the first (1962-66) and the second (1967-1971) five-year economic development plans were established and executed, which brought about the conversion of the national economy from agriculture to manufacturing industry. So, agriculture and agricultural policy were subject to the national economic plan.

During this period, the highest priority was given to overcoming the national problem of poverty and to the need to make the country self-supporting through industrialization. This led to a focus on light industry and exports. Under these circumstances, an increase in farm productivity to achieve self-sufficiency in staple grains and an increase in farm household income through improved agricultural productivity were both national and agricultural problems. Therefore, the modernization of the farming infrastructure, the stabilization of prices for farm products, and an increase in the amount of farm products became the main goals of the agriculture industry. It is at this point that measures for farmland improvement, like land development, land reclamation, the improvement of water sources for agricultural use, the development of farming technology, education in farming skills, and the mechanization of farm work became the main features of agricultural policy.

Another goal during this period was the increase of farm household income, which was necessary partly because of the lower grain price policy implemented to support a competitive manufacturing industry. To achieve this goal, the prices of farm products were supported by the Stabilization of Farm Product Prices Act, as well as by the industrialization of the rural economy which included measures to promote the business of processing and storing farm products. And special measures to increase farmland income, such as the promotion of rural subsidiary businesses and the development of special products by rural villages, were

established in 1968. But, the income gap between farm households and urban wage earner households increased in the late 1960s, due to industrialization policy (Kim et al., 2004). Therefore, the lower rice price system was abolished from 1968, and a two tier grain price system was adopted in 1970.

Finally, despite the fact that the farmland system had been reformed since the 1940s, in order to put an end to farmland tenancy as well as to the small owner-farmer system, farm land tenancy continued to be endemic in the 1960s, as a result of farm exit due to industrialization at this time; and the problems of small-scale farming were not solved, due to the division of farmland among small-scale farmers (Kim and Lee, 2004; Kim et al., 1999).

3.3.3.2 In the 1970s

During this period, the third (1972-76) and the forth (1977-81) national economic development plans were carried out, and the development of the agricultural industry was adopted as a goal of the national economy, a goal that was prompted by the increase in the gap between farm household income and urban household income. This led to the increase of farm household income and the promotion of cultural and public health facilities in rural areas, as well as the achievement of self sufficiency in staple grains, being adopted as the main goals for the agricultural sector. These goals were accompanied by measures for the development of farming infrastructure and the mechanization of farming, farming products price support, the improvement of the agricultural marketing structure, and the promotion of stock raising and fruit and vegetable farming.

Meanwhile, the industry-centred economic policy had caused a rural exodus and rural areas had experienced inferior living conditions which were thought to be an obstacle to further national economic development. Therefore, the improvement of living conditions in rural

areas became one of the main goals. The SAE-MA-UL movement, which included housing renovation, the promotion of income improvement through the cultivation of cash crops, and the development of the production infrastructure, were strategies for rural development. Although the government tried to increase farm household income, its industrial policy eventually led to rural people leaving the land because it created many non- farm job opportunities in urban areas.

Meanwhile, controversy arose over the benefits of trade liberalization, due to the financial deficit caused by a two-tiered grain price system and a shortage of farm products from the late 1970s on. An import liberalization policy adopted from 1978, following inflation and pressure from foreign countries like the United States, changed the Korean economic strategy from one of protection to one of import liberalization. As a result, trade in farm products has been increasingly liberalized since then. Kim et al. (2004) argued that the direction of the national economic policy turned towards a market oriented policy from this time on; but Kim and Lee (2004) described the agricultural policy during this period as a protective policy.

3.3.3.3 In the 1980s

During this period, the fifth (1982-1986) and sixth (1987-1991) five-year economic plans were implemented. Farm household debts became a social issue in the middle and late 1980s, increasing by as much as six and half times between 1980 and 1986. The increase in debt was thought to be due to a heavy fall in the price of red pepper (1978-79), pork and onions (1979), garlic (1980), garlic and red pepper (1983), and beef (1983-85), and the freezing of the official purchase price of rice in 1983 was another reason. To cope with this problem, agricultural policies to reduce farm household debt were promulgated on six occasions.

However, these policies did not solve the problem, having more of a “band-aid” effect (Kim et al., 2000).

The balance of payments went back into the black during 1986-1989. Furthermore, the growth rate of the national economy reached about 13% in the late 1980s. Since then, economic policy has turned from a government-led protective economic policy to a market-led open economic policy (Kim et al., 1999). As a result of this change in national economic strategy, the direction of Korea’s agricultural policy changed from a focus on self-sufficiency in staple grains to an open market policy. Measures introduced to increase farm household income were diverted from their original aim of stimulating production increases and supporting farm prices to promoting mixed farming of vegetable production and stock breeding.

The development of the industrial complex project (1984) and the promotion of the combined agriculture project (1983) were executed to support the increase of farm household income. Measures like the promotion of rural tourism (1983), the promotion of traditional foods and the development of farm product processing complexes (1989), and the development of home industries such as silkworm culture and cash crop cultivation, were also initiated to utilize farmers’ time in the slack season and increase farm household income. And an integrated rural area development policy, which included the development of farming and marketing infrastructure, was adopted to decrease the gap between rural and urban areas.

Meanwhile, the phenomenon of the exodus of people from rural areas continued. This led to the adoption in 1981 of the successor farmers set up program to induce young people to enter farming. Meanwhile, the bipolarization between small farms and large farm households deepened (Kim and Kang, 2005). But the proportion of medium-scale farmers grew during

this period, because some small farmers increased their farm size by cultivating the farmland left behind by farmers who had given up farming and moved out of rural areas. As a result, positive agricultural structural adjustment policy was not needed for the agricultural industry during this period (Kim, 1992).

During this period, an increase in farm household income and the development of rural areas were the main goals of agricultural policy, which sought to counterbalance the effects of the industrialization policy. However, although measures for achieving these goals were put into practice, they were only temporary expedients.

3.3.4 The period of trade liberalization

Agricultural policies in the 1990s were more affected by trade liberalization than by the national economic plan, and this can be attributed to graduation from the BOP clause and the conclusion of the UR (Uruguay Round) negotiations. Meanwhile, there is disagreement about which was the turning point in trade liberalization – graduation from the GATT **(**General Agreement on Tariffs and Trade) BOP clause or the conclusion of the UR negotiations (Kim et al., 2004). Here, graduation from the GATT BOP clause is considered as the turning point of trade liberalization, because the Korean government announced its import liberalization plan at this time.

3.3.4.1 In the late 1980s

In 1989, Korea promulgated a three-year import liberalization plan according to which trade in 243 farm products would be liberalized from 1989 to 1991. This followed pressure from farm-product-exporting countries like the United States. However, after Korea graduated from

the BOP clause in 1989 – a move which was directly due to a balance of payments surplus during 1986-1989 – it found that by 1997 it had to import 273 farming items.

Meanwhile, during 1989-1991, the domestic price of major farm products like rice, apples, pork, and sesame seeds was between two and ten times higher than that of international products, which gave Korean farmers a sense of crisis. Korean agriculture faced trade liberalization without sufficient preparation for it (Kim, 2000), and therefore improvement of the international competitiveness of the Korean agricultural industry was the most urgent problem for agricultural policy during this time.

Under these circumstances, the Rural Development Comprehensive Plan was established in 1989 to revitalize the rural economy against the background of a fully liberalized agricultural market. This plan aimed at improving agricultural structure to increase competitiveness and productivity by increasing farming scale per farm household. To achieve this goal, a rural development agency was established and the Farmland Act was revised to permit the rent and lease of farmland.

3.3.4.2 In the 1990s

In the 1990s, overcoming the structural weaknesses of the agricultural industry – for example, the small scale of farming, the increasing average age of farmers, and the pre-modern production infrastructure – was the most urgent agricultural problem following the conclusion of the UR negotiations (Kim and Lee et al., 2000). Therefore, the Agricultural Structural Improvement Plan was established to strengthen the competitiveness of agricultural products. Although as early as 1967 the Basic Law on Agriculture emphasized the need for structural adjustment through the promotion of family farms, agricultural structure adjustment only really got into its stride in the 1990s (Lee et al., 2004).

The plan had two goals. One was to improve agricultural structure for competitive agricultural industry; and the other was the revitalization of rural areas. The primary measures to achieve the first goal were: promotion of elite farmers; improvement of farming infrastructure; mechanization and modernization of production; farming technology development and expansion of information technology; improvement of farm products distribution infrastructure; increase of farming scale by farm household; and promotion of agricultural products exports. Primary measures for the second goal were: development of income sources in rural areas, improvement of living conditions; and support for the employment and retirement of old farmers. The measures of the plan can be categorized into three policies: competitiveness policy, rural development policy, and farm entry and exit policy, by separating farm entry policy from competitiveness policy and farm exit policy from rural development policy, because farm entry and exit policy relates to human resources and the others relate to material resources.

One of the significant things about this plan is that, for the first time, farm entry and farm exit policy became one of the major policies.

The anticipation that elite farmers would be the core power which strengthened the competitiveness of the agricultural industry was an idea on which there was a broad consensus, because it was thought that these farmers could adopt new technology in farming and operate farms more efficiently (Lee, 1992). In this regard, a policy for promoting young farmers was highlighted. In 1990, the Special Measures for the Development of Rural and Fishing Areas were enacted and these stipulated that efforts should be made to encourage young prospective farmers. In 1991, a scheme that aimed to promote the entry into farming of ten thousands of successor farmers annually was announced with the establishment of the

Agricultural Structure Improvement Plan. Since 1993, young farmers who are selected as successor farmers have been exempted from military service, and the Korean National College of Agriculture was established to educate prospective farmers in 1997.

In addition to this, the exit of old farmers also became one of the main concerns, and the government encouraged old farmers to retire from farming by helping them to find alternative jobs in rural areas. The development of factory sites which would induce manufacturing companies to set up plants in rural areas was one of the main measures. And a direct payment for farmland transfer program, which was the origin of the active policy for inducing old farmers to retire from farming, was adopted in 1997.

The conclusion of the Uruguay Round of GATT brought increased liberalization of world trade, and in Korea the Five Year Plan for New Agricultural Development was made following the establishment of a civilian government in 1993. The plan expressed a clear intention to change the direction of agricultural policy from production increase and price support to agricultural structural adjustment. As a result of this, regulations on the ownership and use of farmland were eased, and the upper limit for the amount of farmland farmers could own was increased from 3ha to 10ha, so as to support an increase in farming scale. The Agriculture and Rural Area Comprehensive Development Plan of 1994 announced ten measures, including promotion of 150 thousand family farms, adoption of agricultural corporations, and completion of the development of farming infrastructure, to increase the competitiveness of agriculture.

Meanwhile, when national financial crisis befell Korea in 1997, the problems of the People's Government, which was established in 1998, were to overcome the economic crisis and prepare for the future. At this time, a decrease in the consumption of farming products, an

increase in the price of farming material, and an increase in interest rates also threatened the farm household economy. So, the stabilization of the farm household economy became an urgent problem. It was under these circumstances that the government established the Agriculture and Rural Development Comprehensive Plan and the Forty Five Trillion KRW Investment Plan of 1998, although the circumstances were similar to those of the early and middle years of the 1990s (Kim et al., 1999). According to the plan, the goals of agricultural policy were self-sufficiency in staple grains, increase of farm household income to the level of non-farm wage earners' income, and improvement of the quality of life and the welfare system in rural areas (MAF, 1998). The measures devised to achieve these goals were similar to those of the plan of 1991.

Meanwhile, rural development policy became another significant way to overcome the problem of the rural exodus which was taking place during this period, because improvement in living conditions was believed to induce people to stay in rural areas and to contribute to the rehabilitation of these areas. This strategy was different from previous policies, in that rural areas were considered as a place for living rather than as an economic space. Measures like residential regional development, which aimed to develop roads, waterworks, playgrounds, parking, housing, marketing infrastructure and sewage disposal facilities in country areas, and the development of residential villages, were adopted in 1990. In this way, rural development policy was established in order to indirectly affect farm entry and farm exit during this period.

3.3.4.3 In the 2000s

In 2004, with the establishment of participatory government, the Agriculture and Rural Development Comprehensive Plan was established on the basis of evaluation of the

performance of mid-to-long-term plans like the Agricultural Structure Improvement Plan of 1991.

According to the plan of 2004, the plan of 1991 had contributed to the improvement of farming infrastructure and marketing infrastructure and the enlargement of the scale of farm households. But the 2004 plan indicated that the 1991 measures for stabilizing farm household income and improving the welfare system in rural areas were not efficient. In particular, the effect of agricultural structural adjustment was not effective, because it did not support the farm exit of old farmers. Now, it was anticipated that the trade liberalization which followed the negotiations of the DDA (Doha Development Agenda) and FTA (Free Trade Agreements) would increase the income gap between rural and urban areas.

Therefore, the 2004 plan suggested three strategies: market-oriented agricultural policy; the development of a farm household income stabilization system; and rural area development and the enlargement of the welfare system in rural areas. Five core problems that needed tackling if these strategies were to be successful were: the promotion of young farmers; the improvement of the agricultural land system; the promotion of the rice industry; enlargement of the direct payment system; and enlargement of the social safety net and basic welfare system.

3.4 Agricultural structural adjustment policy since the 1990s

3.4.1 Overview

The Agricultural Structural Improvement Plan of 1991 was the foundation for other mid-to-long-term plans like the plans of 1998 and 2004, both of which were established on the basis of evaluation of the performance of the agricultural structure improvement plan. For this

reason, the goals and accompanying measures of agricultural structural adjustment policy since 1991 can be seen in the 1991 plan.

In this context, agricultural structure refers to the combination of farmers and farmland, and agricultural structural adjustment policy embodies the steps taken to affect the numbers and age distribution of farmers and the utilization and ownership of farmland (Section 1.6).

The means used by the plan to intervene in the numbers and age distribution of farmers are farm entry and exit policy, which aims to affect these factors by inducing young people to enter farming and old people to leave it. In addition to this, rural development policy, which was the second most important element in the plan, was also established to indirectly affect farm entry and exit, although the measures used were different from those used by farm entry and exit policy. Its focus can be seen in the saying that "To prevent the exodus of young people from rural areas, living conditions in these areas, like education, medical services, and housing, should be urgently improved and more diverse income sources for farmers should be developed" (Lee, 1992: p. 5).

Meanwhile, the competitiveness policy, which was the most important element of the plan in 1991, aimed to improve underdeveloped farmland. "Given that agricultural market liberalization is inevitable, it is vital that the competitiveness of the agricultural industry should be improved to compete with foreign agricultural products" (Lee, 1992: p. 5) and "……underdeveloped farming infrastructure should be developed to improve agricultural structure" (Lee, 1992: p. 6). The competitiveness policy focused on developing farming and marketing infrastructures.

Like the 1991 plan, agricultural structural adjustment policy since 1991 can be divided into three policies: farm entry and exit policy, competitiveness policy, and rural development policy, these are summarized in Table 3.2.

Table 3.2 Agricultural structural adjustment policy since 1991

	Primary measures
Farm entry and exit policy	A young farmer start-up program; a direct payment for farmland transfer program
Competitiveness policy	A land development project; a land reclamation project; a development of water for agricultural use project; a farming technology development project; a farming skills education project; a development of farming infrastructure project; a mechanization of farming project; an improvement of marketing structure project.
Rural development policy	A farm products processing and storage business promotion project; a promotion of rural subsidiary business project; a promotion of stock raising, fruit, and vegetable farming project; a development of industrial complexes project; a promotion of combined agriculture project; a rural tourism promotion project; a traditional food development project; a project to develop farm product processing complexes; a project for the development of home industries like silkworm culture and cash crop cultivation

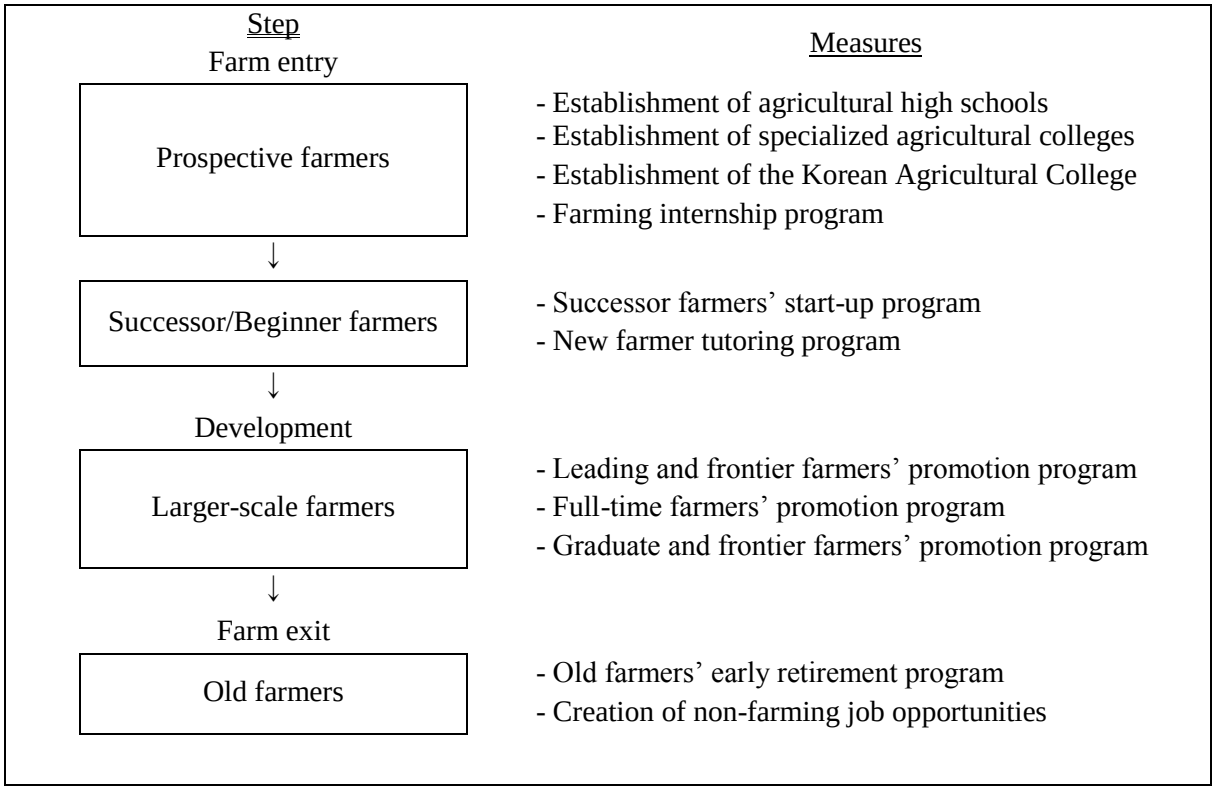
(Source: Own table)

3.4.2 Farm entry and exit policy

3.4.2.1 Farmers' promotion system

As was seen in Section 3.3.4.2, farm entry and exit policy became one of the main agricultural policies from 1991 on, because farm entry and exit were believed to contribute to the competitiveness of the farming industry. According to the Ministry of Agriculture and Forestry (2004) and Lee et al. (2004), the farmer's life cycle, and the farmers' promotion system which has been formulated since the 1990s, can be summarized as shown in Figure 3.8.

Figure 3.8 Farmers promotion system



(Source: Own figure)

3.4.2.2 Farm entry policy

First, at the level of prospective farmers, farm entry policy mainly aims to revitalize education through agricultural high school, agricultural colleges and universities, and to teach students farming and management skills prior to their becoming engaged in farming. An independent agricultural high school promotion project (1995-97) was run to insure the adequacy of the education in farming and management skills provided by agricultural high schools, and schools which were selected as independent agricultural high schools could establish modern experimental and practice facilities with help from the government. The Korean National College of Agriculture was established to promote successor farmers in 1997, and graduates had to undertake to pursue a farming career for at least six years. A specialized agricultural university promotion project (1996-2000) was also adopted to encourage universities to

contribute to the development of agriculture in their regions, and this enabled universities to install equipment and facilities which were needed for agricultural education and for research and development in agriculture. In addition, the farming internship program, which was adopted in 2005, aims to help prospective farmers be successful farmers by experiencing farm work on well-run farms.

Second, at the level of successor farmers, the farm entry policy helps young farmers acquire farming assets. The successor farmers set up program, which has been running since 1981, aims to lend prospective farmers money at a low interest rate so that they can purchase farming assets. And the new farmers' tutoring program, adopted in 2005, helps new farmers succeed by giving them a chance to learn farming and management skills from skilled farmers or specialists. This program is also intended to encourage prospective farmers to enter farming by decreasing the probability of failure in their chosen field. Finally, if prospective farmers are selected as successor farmers, they can increase their farm size by taking out a loan from the government.

Third, at the level of larger-scale farmers, the farm entry policy has supported an increase in the amount of farmland young farmers can obtain. A full-time farmers' promotion project was operated from 1992 to 1998, and this aimed to promote specialized, modernized, larger-scale farming. Successor farmers and other farmers who had some experience of larger-scale farming, a farming career, and farm management skills could be selected and supported by a government loan. A promotion program for university graduates and frontier farmers was run from 1993 to 1994 in order to help farmers who had had college and university-level education become full-time farmers. And a leading and frontier farmers' promotion program was operated from 1995 to 1998, so that the government could help young farmers grow into

competitive farmers and ensure that they were taught farming and management skills. Farmers who were selected as frontier farmers by these programs could get loans at a low rate of interest.

3.4.2.3 Farm exit policy

A primary measure for encouraging farm exit by old farmers is the direct payment for farmland transfer program, which was adopted in 1997 under the influence of the launch of the WTO (World Trade Organization) in 1995. Old farmers who want to exit from farming can sell or lease their rice fields to other farmers who are aged under 60 and who cultivate rice fields totaling over 1.5 ha, or to the Korean Rural Community and Agriculture Corporation. The direct payment for farmland transfer program aims to facilitate the farm exit of old farmers by supporting their income after retirement through this direct payment system. And measures to develop factory sites in rural areas and to promote rural tourism have also induced farm exit.

3.5 Agricultural structural adjustment policy in other countries

3.5.1 Overview

As was seen in Section 1.1, there are many kinds of drivers of structural adjustment policy both within the farming sector and outside of it. Among them, economic liberalization in the Russian Federation (Noskova and Mezhonova, 2008), trade liberalization in the United States (Blandford and Boisvert, 2004), Mexico (Romero, 2008), Vietnam (Minh, 2008), and Indonesia (Ahmad, 2008), industrialization in Chinese Taipei (Hsial, 2008), poverty reduction in Thailand (Yongchareon and Wongchantrakarn, 2008), the economic crisis in New Zealand (Forrest, 2008), and budgetary problems in the European Union (Cahill and Hill, 2006) are

the most influential drivers of the reform of agricultural policy or agricultural structural adjustment policy, although these motives are combined in many countries.

Although the motives of agricultural structural change and agricultural structural adjustment policy differ, the foci of agricultural policy or agricultural structural adjustment policy can be categorized by country according to some notable features, even though it is difficult to classify them strictly. For example, New Zealand (Forrest, 2008) has prioritized farm entry and farm exit and diversification; Malaysia (Sajari, 2008), Chile (LeBert, 2008), Vietnam (Minh, 2008), Mexico (Romero, 2008), and the Russian Federation (Noskova and Mezhonova, 2008) have emphasized competitiveness in agricultural industry; and Australia (Weston and Whatman, 2008), the United States (Blandford and Boisvert, 2004), the European Union (Cahill and hill, 2006), and Thailand (Yongchareon and Wongchantrakarn,2008) have laid stress on both these areas, or on others like poverty reduction and social welfare.

3.5.2 Agricultural structural adjustment policy by countries

In the European Union, the CAP (Common Agricultural Policy) reform to reduce price support, which is due to budget constraints and the enlargement of EU membership, and negotiations on multilateral and bilateral trade liberalization, are the motives of agricultural structural adjustment. Rural development regulations to facilitate structural adjustment are the main body of structural adjustment policy, and the aim of European agricultural adjustment policy is to keep family farms as the farming units in rural areas by making farming profitable and improving farmers' living conditions (Cahill and Hill, 2006). Rural development policy works through measures like farm entry and exit and diversification (Bascou et al., 2004). It is estimated that rural development programs not only protect the EU farming industry from the

pressures of structural change but also facilitate the adaptation of farmers and rural areas (Cahill and Hill, 2006).

In the United States (Blandford and Boisvert, 2004), national policy reform which aims to reduce financial deficit and the pressures brought about by price support reduction due to trade liberalization negotiations have been the main motives of structural adjustment, which is similar to the case of the European Union. However, the United States has no specific agricultural structural adjustment policy; rather, its agricultural industry is subject to its general industrial adjustment scheme. Agricultural structural adjustment policy through the industrial adjustment scheme is intended to compensate for decreases in income and asset value which result from trade liberalization and the reduction of price support. And this policy also aims to increase the mobility of farmers by developing the quality of human capital.

In the case of the United Kingdom (Blandford and Hill, 2006), support for farm household adjustment can be found in the Agricultural Act of 1957 and following pieces of legislation, the goal of which was to restructure the farm household economy. The main measures in this legislation were intended to facilitate the enlargement of farmland, the modernization of farming infrastructure, farming exit, and diversification.

Finally, in the case of developing countries in Asia, agricultural structural adjustment policy for the farming products of exporting countries or agricultural countries like Malaysia (Sajari, 2008) and Vietnam (Minh, 2008) has mainly focused on the increase of competitiveness in order to increase exports. Farm entry and exit policy and diversification do not seem to be the main features of agricultural structural adjustment policy in Asian countries. Table 3.3 below summarizes the goals of, and the measures taken by, agricultural structural adjustment policy, by country.

Table 3.3 Goals and measures of structural adjustment policy by country

Country	Primary Goals	Measures
EU (1960-)	-Farming profitability -Maintenance of family farms -Improvement of quality of life of rural people -Solidity	-Development of farming infrastructure -Development of farm product processing and market infrastructure -Farm entry and exit -Diversification -Education and training -Creation of non-farming job opportunities
UK (1950-)	-Restructuring of farming business	-Farmland amalgamation -Farming infrastructure modernization -Farm exit -Diversification -Support for small farm businesses
US (1960-)	-Maintenance of farm income and asset value	-Income support -Training and job relocation -Compensation for asset value reduction -Development of human capital
Australia (1970-)	-Increase in competitiveness, sustainability and profitability	-Financial support -Counselling -Safety net -Training and risk management -Income support
New Zealand (1980-)	-Improvement of international competitiveness	-Rural Bank discount scheme (1986) -Farm exit -Counselling -Financial and welfare support -Diversification of economic activity
Malaysia (2000-)	-Productivity improvement -Development of agricultural industry -Increase in agricultural competitiveness	-Land development, mechanization, production and marketing infrastructure development -Product diversification, farming product processing
Chile (1970-)	-Increase in productivity	-Farming skill development -Diversification of economic activity -Development of irrigation systems - Rural development programs -Promotion of research and development
Thailand Indonesia (2000-)	-Competitiveness -Food self-sufficiency	-Diversification of farmland utilization -Promotion of research and development -Credit for farmers -Small farmers innovation

Vietnam (1990-)	-Increase in farmers' income -Agricultural effectiveness -Rural development	-Land reform -Commercialization -Privatization
Mexico (1980-)	-Development of agricultural industry	-Land ownership reform -Promotion of agricultural products marketing -Income stabilization through price support
Chinese Taipei (1970-)	-Increase in productivity -Increase in farm income -Rural development and prosperity	-Abolition of input support -Support for agricultural credit -Improving agricultural and rural infrastructures
Russian Federation (1990-)	-Privatization of agricultural resources -Development of rural areas	-Research and development -Financial and credit support -Support for off-farm business

(Source: Own table)

3.6 Summary and conclusion

This chapter has described the vulnerable characteristics of agricultural structural change (Section 3.2). It has also described the evolution of agricultural structural adjustment policy since 1945 to respond to these characteristics, and investigated the channels through which agricultural structural adjustment policy has sought to affect farm entry and exit (Section 3.2).

With the rapid decrease of the farming population, the number of young farmers in Korea has abruptly declined, and the number of old farmers has increased, since the 1960s.The predominance of farmers who cultivate small farms and have only rudimentary schooling is thought to be an obstacle to the government's efforts to increase the competitiveness of agricultural industry (MAF, 1991).

Under these circumstances, as was seen in Section 3.3, agricultural structural adjustment has been regularized since the 1990s in order to bring about smooth intergenerational change through the facilitation of farm exit for old farmers and farm entry for prospective farmers. It

has been shown that although agricultural structural adjustment policy has tried to facilitate farm entry and exit directly through farm entry and exit policy, measures introduced as part of competitiveness policy, like the promotion of larger-scale farms and the development of farming infrastructure, as well as those of rural development policy, like the creation of non-farming jobs in rural areas and the improvement of living conditions there, can indirectly affect farm entry and exit (Section 3.3.4.2.).

The motives for agricultural structural adjustment policy in other countries differ according to country, and each country has a unique agricultural structural adjustment policy and unique measures for implementing this (Section 3.5). This implies that the effect of agricultural structural adjustment policy on agricultural structure will not be the same in different countries, due to differences in the intensity of these policies (Section 2.4.4.), and research studies on the effect of agricultural structural adjustment policy in one country should not be directly applied to other countries.

Although Korean agricultural structural adjustment policy has been conducted as a way of helping the agricultural sector survive during an era of industrialization and trade liberalization through successful farm entry and exit, it has been concluded that the policy has not been effective (Kim and Lee, 2000; Lee et al., 2004). Accordingly, the next chapter analyzes the effect of agricultural structural adjustment policy on farm entry and farm in Korea, to investigate to what extent the agricultural structural adjustment policy contributes to farm entry and farm exit.

CHAPTER 4

THE EFFECT OF AGRICULTURAL STRUCTURAL ADJUSTMENT POLICY ON FARM ENTRY AND EXIT

4.1 Introduction

Since the 1990s, agricultural structural adjustment policy has been accepted in Korea as the way to induce smooth intergenerational transfer of farmland, by facilitating farm entry and exit (Section 3.3.4.2). However, since the introduction of the policy, the number of young farmers has continued to decrease and the number of old farmers to increase (Figure 3.3).

There is plenty of other evidence that calls into question the effect of agricultural structural adjustment policy on farm entry and exit. For, example, the ratio of farm operators who had successors was about 16.4% in 1990 but it had fallen to 3.5% by 2005 (NSO, 2008). And the amount of money sent back by young people who had moved to urban areas was about 310,000 KRW, which accounted for only 1.28% of farm household income in 2006 (NSO, 2008). This implies that young people are moving into urban areas to settle down there rather than to maximize farm assets and return home. By contrast, the tendency of old people to leave farms has decreased (Jung and Min et al., 1997; Park and Jung et al., 2000). According to these researchers, over 80% of old people wanted to continue farming or to enlarge the size of their farms.

Then, there arises the question of whether agricultural structural adjustment policy, especially farm entry and exit policy, either does not help to smooth farm entry and exit, or does not affect farm entry and exit at all. As was seen in Section 1.1, although the argument about this continues, there seems to be little empirical research on the effect of agricultural structural

adjustment policy on farm entry and exit in Korea. Furthermore, it seems that tax payers and non-farm industries are criticizing agricultural structural adjustment, policy and the investment that it involves, from the point of view of an increasing belief in the role of the market in farm entry and exit.

Accordingly, this chapter investigates to what extent agricultural structural adjustment policy affects farm entry and exit, in order to evaluate the arguments on this subject (Section 1.1). And the results will be used to estimate the possibility that the effect of farm entry and exit policy is restricted by related policies or by other circumstances, like farming conditions (Section 1.2).

This chapter consists of three sections. In Section 4.2, the effect of agricultural structural adjustment policy on farm entry is analyzed using data on new farm entrants and macro economic data, like the unemployment rate and income figures. Section 4.3 deals with the effect of agricultural structural adjustment policy on farm exit using the same methods as Section 4.2. Finally, conclusions about the effect of agricultural structural adjustment policy on farm entry and farm exit are drawn up in Section 4.4.

4.2 The effect of agricultural structural adjustment policy on farm entry

4.2.1 The effect of agricultural structural adjustment policy on new farm entrants

4.2.1.1 Overview

Agricultural structural adjustment policy is divided into farm entry policy, competitiveness policy, and rural development policy, and these policies include diverse measures, programs and projects, like the establishment of agricultural schools, farming skill education, farming

infrastructure development, promotion of larger-scale farms, and promotion of rural tourism (Section 3.4).

Meanwhile, the effect of agricultural structural adjustment policy on farm entry can be estimated at policy level, at program level, or at project level, on an assumption of *ceteris paribus*. But it seems to be difficult to evaluate the effect at program or project level, because it is barely possible to separate the effect of a specific program or project from the effect of agricultural structural adjustment policy itself, due to the kind of data available and the relationships between measures. Therefore, the effect is estimated at the level of agricultural structural adjustment policy.

The analysis of the effect of agricultural structural adjustment policy on farm entry is conducted using existing data on new farm entrants, that is, successor farmers, and other demographic and economic data, like the population of farmers sorted by age. First, in Section 4.2.1.2, changes in the number of new farm entrants are investigated by analyzing the number of new farm entrant by years. Then, in Section 4.2.1.3, the investigation focuses on whether the ratio of farm entrants drawn from those who can be considered as prospective farmers, that is from agricultural high school graduates and agricultural college graduates, has increased or not. This is investigated by comparing the ratios of each age group to the total of farm entrants. Finally, in Section 4.2.1.4, we investigate whether the ratio of successor farmers who have more educational background, like college graduates, has increased or not, by comparing the ratio of farm entrants by educational background.

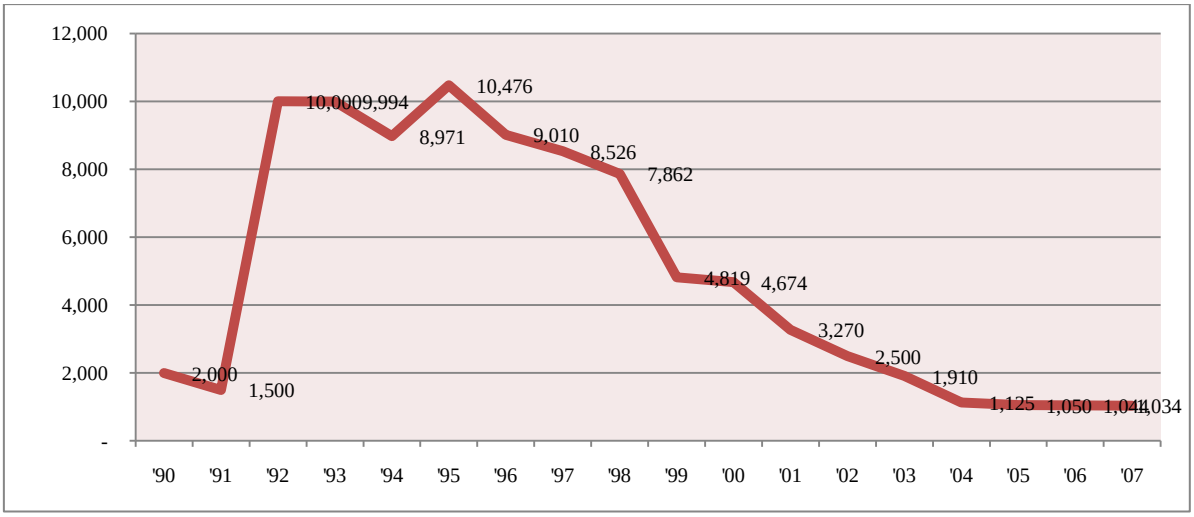
4.2.1.2 Analysis of farm entrants by year

From 1981 to 2007, about 131,000 young people were engaged in farming as successor

farmers, and about 89,000 of these had entered farming since 1990, when the farm entry policy was implemented (MAF, 2008).

Figure 4.1 below shows the number of new farm entrants by year. The number of new farm entrants was about 2,000 each year in 1990 and 1991. But the number had increased to about 10,000 by 1995. It then gradually decreased from 1999 to 2003. Since 2004, the number of successor farmers has fallen dramatically to about 1,000 a year, which is partly because the government has changed the upper age limit at which prospective farmers can be eligible to become successor farmers from 40 to 34, to focus on promoting younger farmers.

Figure 4.1 Numbers of new farm entrants financed by government



(Source: www.nso.go.kr)

The above data partly support the argument that farm entry policy did not prevent a dramatic decrease in farm entrants. Although the decrease in new farm entrants was partly due to the fact that the government reduced support for prospective farmers, the main reason was that the number of prospective farmers who wanted to be engaged in farming decreased. According to data from MAF (2008), the number of young people who wanted to be engaged

in farming was about 6,000 in 2000, but had decreased to about 1,600 in 2007, which could be further evidence that farm entry policy did not prevent a fall in farm entrants.

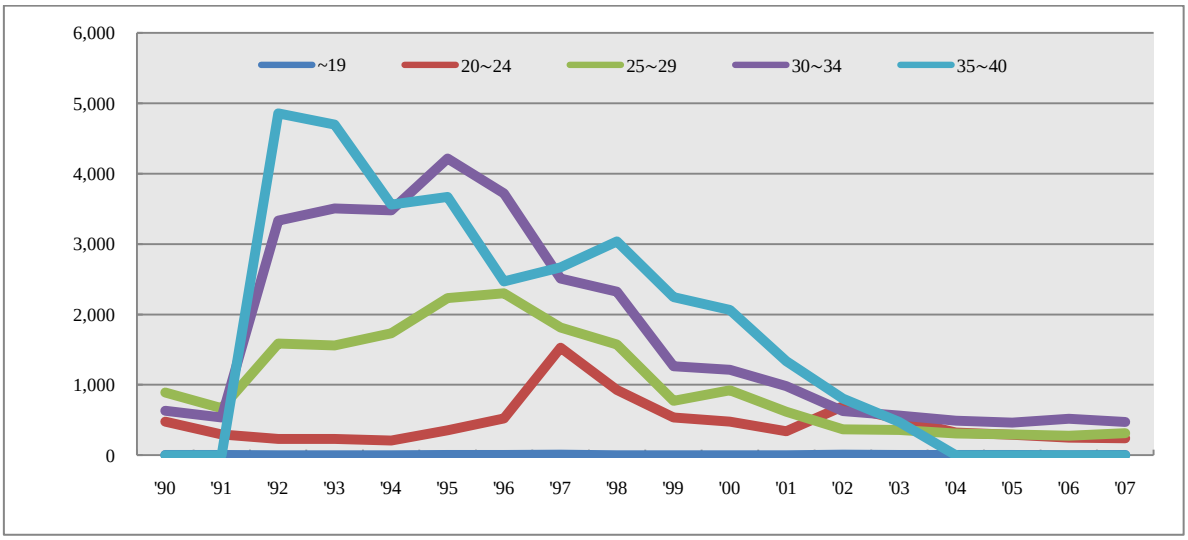
4.2.1.3 Analysis of farm entrants by age

Data and method

Of 89,765 new entrants into farming between 1990 and 2007, the number who were aged 35-40, 30-34, 25-29, and 20-24 was 31,878 (36%), 30,827 (34%), 18,584 (21%), and 8,433 (21%) respectively. But the number of farm entrants who were aged 19 and under was only 46.

Figure 4.2 below shows the trend in the numbers of farming entrants by year and by age group, with the age group of 40 and under divided into under 20, 20-24, 25-29, 30-34, and 35-40. The graph shows that old farm entrants – those aged 35-40 and 30-34 – totaled more than young farm entrants – those aged 20-24 and 25-29 – in almost every year between 1990 and 2007.

Figure 4.2 Numbers of new farm entrants by year and by age group



(Source: www.nso.go.kr)

Now we shall investigate the ratio of each age group to the total number of farm entrants in the different periods, in order to determine which of the five age groups have increased as a percentage of the whole, and which have decreased, between 1990 and 2007.

The government has focused on ensuring that agricultural school graduates, that is prospective farmers, subsequently undertake a farming career (Section 3.4.2.2). Prospective farmers – agricultural high school and agricultural college graduates – are thought to be engaged in farming in their late twenties at the latest, if they engage in farming directly after graduation, although they must do their military service. Therefore, prospective farmers are thought to be included in the age groups 20-24 and 25-29. If the ratio of these age groups to the total of farm entrants has increased, it would support the argument that agricultural structural adjustment policy is not ineffective.

The period 1990-2007 is divided into four categories: the first half of the 1990s (1990-1994, Period Ⅰ); the second half of the 1990s (1995-1999, Period Ⅱ); the first half of the 2000s (2000-2004, Period Ⅲ); and the second half of the 2000s (2005-2007, Period Ⅳ). It is also divided into two categories: the 1990s (1990-1999, Period A); and the 2000s (2000-2007, Period B). The ratio of each age group to total farm entrants is calculated by dividing the number of farm entrants in each age group by the total number of farm entrants. The age group 35-40 was excluded from the analysis because people who are aged 35-40 have not been supported as farm entrants since 2004.

By doing this, the ratio of each age group in a period can be compared with those of other periods, to investigate whether the ratio has increased or not. For example, the ratio of the age group 20-24 in period Ⅲ (2000, 2001, 2002, 2003, and 2004) is compared with that of period

Ⅱ(1995, 1996, 1997, 1998, and 1999), and whether the ratio has increased or not is determined by the results.

Whether the ratio of farm entrants by age groups was different in different periods was investigated by the Mann-Whitney U test, which compared the ratios of certain age groups between periods. The period was the independent variable, and the ratio was the dependent variable. An ANOVA and a t-test were not used because the data set of some age groups was not normal according to the Shapiro-Wilk test.

Results

First, the ratio of the age group 19 and under was not significantly different between Period Ⅰ and PeriodⅡ(*z*=-.106, *p*=1.000), between Period Ⅰ and Period Ⅲ (*z*=-.970, *p*=.421), between Period Ⅰ and PeriodⅣ (*z*=-.615, *p*=.571), between PeriodⅡ and PeriodⅢ (*z*=-.742, *p*=.548), between PeriodⅡ and PeriodⅣ (*z*=-.905, *p*=.393), and between PeriodⅢ and PeriodⅣ (*z*=-.764, *p*=.571). This means that the ratio of young farmers aged 19 and under did not significantly change between 1990 and 2007.

Second, the ratio of the age group 20-24 was not significantly different between Period Ⅰ and PeriodⅡ (*z*=-1.149, *p*=.310), between Period Ⅰ and PeriodⅢ (*z*=-1.176, *p*=.095), between Period Ⅰ and PeriodⅣ (*z*=-1.938 *p*=.071), between PeriodⅡ and PeriodⅢ (*z*=-1.358, *p*=.222), between PeriodⅡ and PeriodⅣ (*z*=-.905, *p*=.393), and between PeriodⅢ and PeriodⅣ (*z*=-.764, *p*=.571). This means that the ratio of the age group 20-24 did not significantly increase between 1990and 2007.

Third, the ratio of the age group 25-29 was not significantly different between Period Ⅰ and

Period Ⅱ (z=-.104, p=1.000), between Period Ⅰ and Period Ⅲ (z=-.970, p=.421), between Period Ⅰ and Period Ⅳ (z=-1.938, p=.071), between Period Ⅱ and Period Ⅲ (z=-1.149, p=.310), between Period Ⅱ and Period Ⅳ (z=-1.938, p=.071), and between Period Ⅲ and Period Ⅳ (z=-.149, p=1.000). This means that the ratio of the age group 25-29 did not significantly increase between 1990 and 2007.

Finally, the ratio of the age group 30-34 was not significantly different between Period Ⅰ and Period Ⅱ (z=-.522, p=.690), between Period Ⅰ and Period Ⅲ (z=-1.567, p=.690), between Period Ⅰ and Period Ⅳ (z=-.447, p=.786), between Period Ⅱ and Period Ⅲ (z=-1.567, p=.151), between Period Ⅱ and Period Ⅳ (z=-.745, p=.571) , and between Period Ⅲ and Period Ⅳ (z=-.745, p=.571). This means that the ratio of the age group 30-34 did not significantly decrease between 1990 and 2007.

A Mann-Whitney test was conducted to investigate whether there was a difference in the ratio of each age group between Period A and Period B. The results show that there was no significant difference in the ratio of the age group 19 and under (z=-.106, p=1.000), and the age group 30-34 (z=-1.244, p=.237). However, there was a significant difference in the ratio of the age group 20-24 (z=-2.339, p=.016) and the age group 25-29 (z=-2.310, p=.021) between the 1990s and the 2000s, which supports the fact that the ratio of farm entrants in their twenties has increased.

Observations

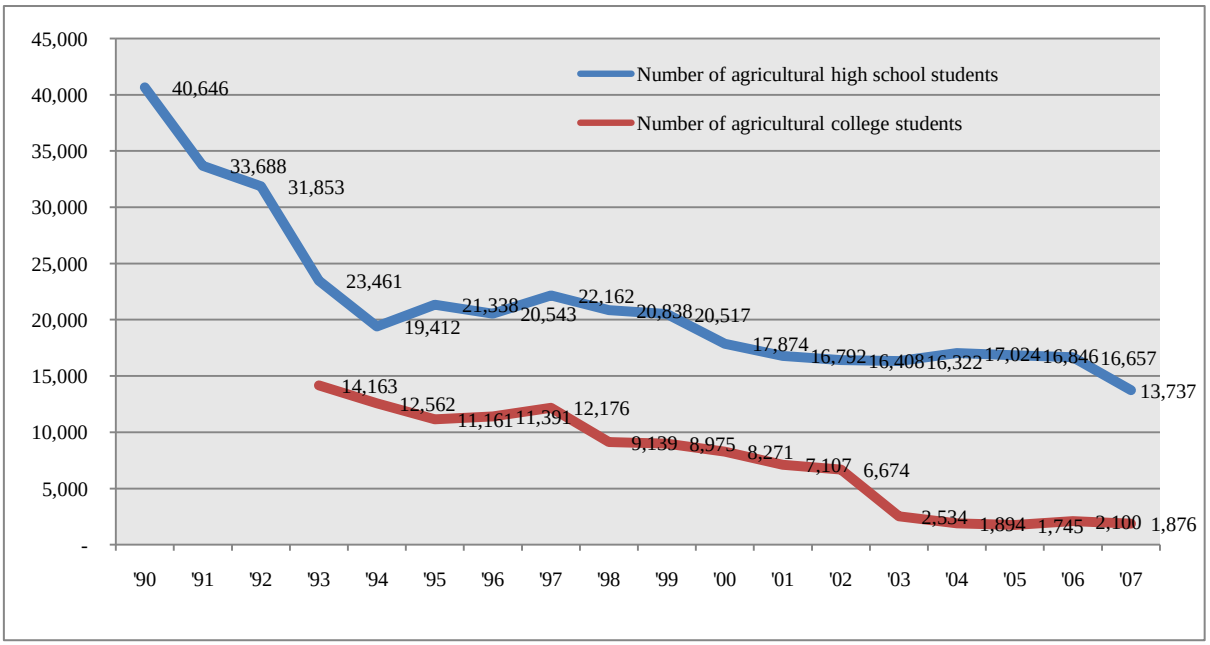
This section deals with how two investigations – one on how the number of farm entrants by age group changed between 1990 and 2007; and one on whether the ratios of the age groups

20-24 and 25-29 to total farm entrants changed between 1990 and 2007 – were carried out; and it gives the results, which are as follows.

Although the number of farm entrants in all age groups has decreased, along with the decrease in the total number of farm entrants, between 1990 and 2007, the ratios of farm entrants aged 20-24 and 25-29 to total farm entrants show an increase when the ratio of the 1990s is compared with that of the 2000s. However, the ratios of farm entrants by age group did not significantly change between periods when the period 1990-2007 was divided by five years.

The decrease in farm entrants could be partly affected by the decrease in prospective farmers amongst agricultural school graduates (Figure 4.3), as well as the decrease of young people who want to be farmers (Section 4.2.1.2). However, the increase in the ratio of farm entrants aged 20-24 and 25-29 is thought to be partly affected by the systematic and intensive farm entry policy which was discussed in Section 3.4.2. In addition, rural amenities could be another factor which attracts young people to take up farming (Kang, 2004), although it seems that the economic difference between farming and non-farm jobs has not lessened.

Figure 4.3 Numbers of graduates of agricultural schools by year



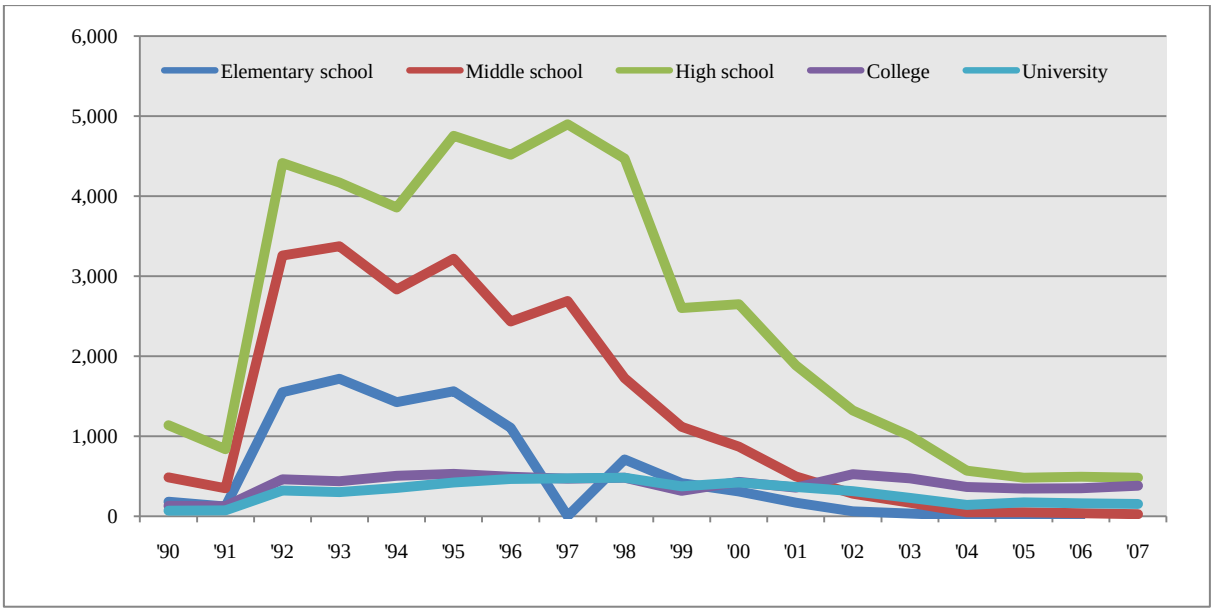
(www.nso.go.kr)

4.2.1.4 Analysis of farm entrants by years of schooling

Data and method

Between 1990 and 2007, of about 89,000 farm entrants, the numbers who graduated from university, college, high school, middle school, and elementary school are 5,268, 7,166, 44,523, 23,449, and 9,362 respectively. Figure 4.4 below shows the number of farm entrants by years of schooling for each year.

Figure 4.4 Numbers of new farm entrants by total schooling received



(Source: www.nso.go.kr)

Although the numbers of elementary school graduates, middle school graduates, and high school graduates have simultaneously and dramatically decreased as the number of farm entrants has decreased, college graduates and university graduates have shown a smoother pace of change.

In the same way that an analysis by age was produced, as described in the previous section, 4.2.1.3, an investigation was carried out, using the Mann Whitney U test, into whether there was a difference over periods of time in the ratio of groups to total farm entrants, by years of schooling received. The period was the independent variable, and the ratio of each schooling category to total farm entrants was the dependant variable.

The period 1990-2007 was divided into four categories of five years and two categories of 10 years. The number of years of schooling was classified into five categories: elementary school; middle school; high school; college; and university. By doing this, it was possible to conduct

an analysis of the difference in the ratio of schooling categories to total entrants by periods. For example, the ratios of college graduates in 1990, 1991, 1992, 1993, and 1994 belong to the data set for Period Ⅰ and the ratios of college graduates in 2000, 2001, 2002, 2003, and 2004 form the data set for PeriodⅢ. The ratios of Period Ⅰ and PeriodⅢ are compared by Mann-Whitney U test.

Results

First, the ratio of elementary school graduates was not significantly different between Period Ⅰ and Period Ⅱ (z=-1.358, p=.222), between Period Ⅱ and PeriodⅢ (z=-1.567, p=.151), between Period Ⅱ and PeriodⅣ (z=-1.509, p=.143), or between PeriodⅢ and PeriodⅣ (z=-1.650, p=.143). But there was a significant difference between Period Ⅰ and PeriodⅢ (z=-2.611, p=.008) and between Period Ⅰ and PeriodⅣ (z=-2.249, p=.036), which means that the ratio of elementary school graduates was lower in PeriodⅢ and in PeriodⅣ than in Period Ⅰ.

Second, the ratio of middle school graduates was not significantly different between Period Ⅰ and Period Ⅱ (z=-1.149, p=.310). But it was significantly different between Period Ⅰ and PeriodⅢ (z=-2.611, p=.008), between Period Ⅰ and PeriodⅣ (z=-2.236, p=.036), between Period Ⅱ and PeriodⅢ (z=-2.611, p=.008), between Period Ⅱ and PeriodⅣ (z=-2.236, p=.036), and between Period Ⅲ and PeriodⅣ (z=-1.938, p=.071). This means that the ratio of farm entrants who were middle school graduates decreased in every period except Period Ⅱ.

Third, there was no significant difference in the ratio of high school graduates between

Period Ⅰ and Period Ⅱ (z=-1.358, p=.222), between Period Ⅰ and PeriodⅢ (z=-1.149, p=.310), between Period Ⅰ and PeriodⅣ (z=-.447, p=.786), between Period Ⅱ and PeriodⅢ (z=-.313, p=.841), between Period Ⅱ and PeriodⅣ (z=-1.342, p=.250), and between PeriodⅢ and PeriodⅣ (z=-2.236, p=.036), which means that the ratio of high school graduates did not change significantly between 1990 and 2007.

Fourth, the ratio of college graduates was not significantly different between Period Ⅰ and Period Ⅱ (z=-.104, p=1.000). But it was significantly different between Period Ⅰ and PeriodⅢ (z=-2.611, p=.008), between Period Ⅰ and PeriodⅣ (z=-2.236, p=.036), between Period Ⅱ and PeriodⅢ (z=-2.611, p=.008), between Period Ⅱ and PeriodⅣ (z=-2.236, p=.036), and between Period Ⅲ and PeriodⅣ (z=-2.236, p=0.036). This result means that the ratio of college graduates increased in every period except period Ⅱ.

Finally, the ratio of university graduates was significantly different between Period Ⅰ and Period Ⅱ (z=-2.402, p=.016), between Period Ⅰ and PeriodⅢ (z=-2.611, p=.008), between Period Ⅰ and PeriodⅣ (z=-2.236, p=.036), between Period Ⅱ and PeriodⅢ (z=-2.611, p=.008), between Period Ⅱ and PeriodⅣ (z=-2.236, p=.036), and between Period Ⅲ and PeriodⅣ (z=-2.236, p=.036), which means that the ratio of university graduates has consistently increased.

A Mann-Whitney U test was conducted to investigate whether there was a difference in the ratios of years of schooling between the 1990s and the 2000s. The results showed that there were significant differences in the ratios of elementary school (z=-2.891, p=.002), middle school (z=-3.554, p=.000), college (z=-3.554, p=.000), and university (z=-3.554, p=.000)

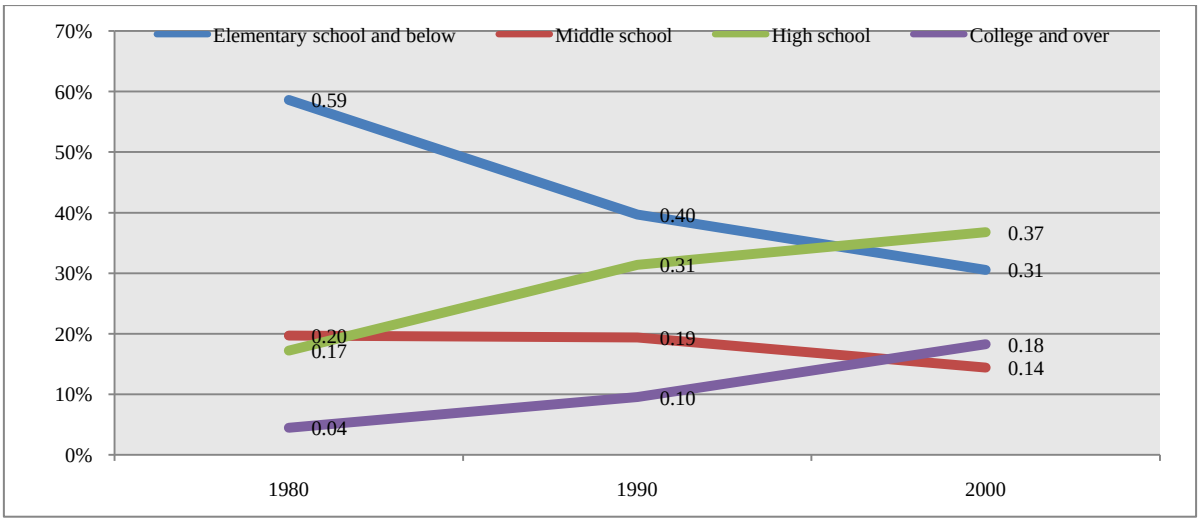
graduates. The exception was the ratio of high school graduates (z=-.355, p=.762), which showed a similar result to that produced when the period 1990-2007 was divided into periods of five years.

Observations

This section reports on an investigation into whether the ratio of farm entrants with higher schooling, like college and university, had increased since 1990, when agricultural structural adjustment policy began to be used positively to intervene in, and improve, agricultural structure. The results of the investigation found that the ratio of entrants into farming with higher schooling, like college and university, had increased, which is thought to be partly due to a positive farm entry policy which promoted programs like that for leading and frontier farmers and that for university graduate and frontier farmers (Section 3.4.2.2).

However, the potential effects of external circumstances should not be ignored. The increase in farm entrants who had higher education was also due to the phenomenon of the Korean pursuit of higher education (Lee, 1999). Figure 4.5 shows the ratio of the Korean population by years of schooling. The ratio of people with only minimal schooling, for example with elementary schooling and below, and middle schooling, has decreased; but the ratio of people with higher schooling, like college and levels above that, has increased.

Figure 4.5 Ratios of the Korean population by total schooling received



(Source: www.nso.go.kr)

Another possible explanation can be found in the change in young people's reason for undertaking higher schooling. In the 1990s, the reason for undertaking higher schooling was to have better job opportunities with the chance of a greater income and social and vocational standing (Lee, 1999). Young people mainly entered an agricultural school in order to enter college or university. So, an agricultural school acted as a ladder to get the non-farm jobs which were accessible to people who had higher schooling year, like college graduates and university graduates. However, it seems that the objective of higher education has changed as time has gone on. According to Kang (2004) and Jyung (1994), the ratio of farm entrants who regard agricultural schools not as a means to enter higher education but as institutions to prepare them for farming was higher in the 2000s than in the 1990s. So, it can be calculated that when the unemployment rate was low in the early and mid 1990s (Figure 4.8), agricultural school college and university functioned as a ladder to non-farm job opportunities. But when the unemployment rate was higher, in the 2000s, they functioned as a ladder to farming.

Although government intervention was estimated to have partly contributed to farm entry by those with higher education, it did not prevent a decrease in the number of prospective farmers. The number of agricultural high school students decreased from about 41,000 in 1990 to 14,000 in 2007, although the number of students attending liberal high schools increased from about 1,473,000 to 1,841,000. And agricultural college students also decreased from about 14,000 in 1993 to 700 in 2007, although the total number of college students increased from 323,000 to 795,000 between 1990 and 2007 (MOE, 2008).

4.2.2 The effect of agricultural structural adjustment policy on the number of young farmers

4.2.2.1 Overview

The goal of farm entry policy, insofar as it relates to prospective farmers, is to prevent an exodus of young and promising people from rural areas and encourage them to engage in farming. However, Korea's industrialization policy has increased the gap in economic and living conditions between rural and urban areas. This gap is believed to be one of the causes of the exit of young people from rural areas, despite the efforts of agricultural structural adjustment policy to respond to it.

Meanwhile, factors which affect farm entry have been theoretically and empirically argued about at micro-level and macro-level, as was seen in Section 2.4. According to previous studies, income difference between farm households and urban households (Ranis and Fei, 1961), profitability of farming (Pietola and Väre, 2003; Foltz, 2004), the unemployment rate (Foltz, 2004) and employment opportunities are considered to affect farm entry.

This section is devoted to investigating how well agricultural structural adjustment policy has

predicted the number of young farmers since 1990, taking into consideration the effect of the above factors on farm entry.

4.2.2.2 Data and method

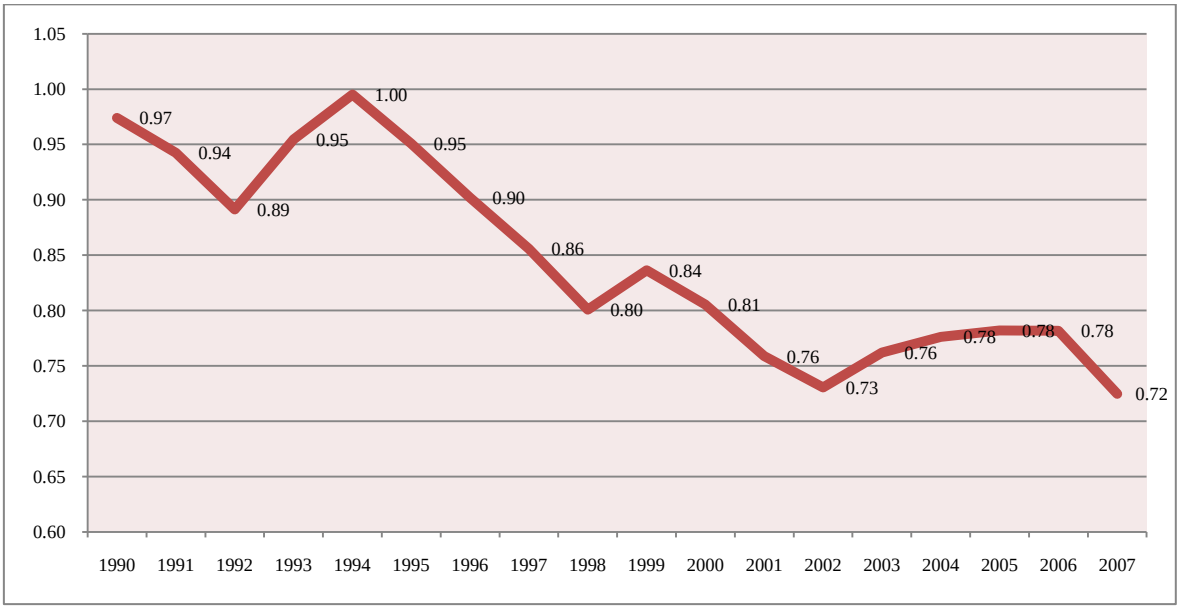
A multiple regression analysis method was used to evaluate how well farm entry policy predicted the number of young farmers when other influential variables were simultaneously included in the model.

Income ratio between farm households and urban wage-earner households, the unemployment rate, the total number of people in employment, farm household terms of trade, and the number of farm entrants were used as predictors in the model, which is summarized in Table 4.1. The dependant variable was the population of young farmers aged under 35.

Description of predictors

First, the income ratio between farm households and urban wage-earner households was defined as the ratio of real income of farm households to that of urban wage-earner households, because this was thought to be positively related to the number of young farmers. Figure 4.6 shows the ratio of real income between the two groups since 1990. The ratio of real income between farm households and urban wage-earner households (2005=1) has worsened, although it shows fluctuation.

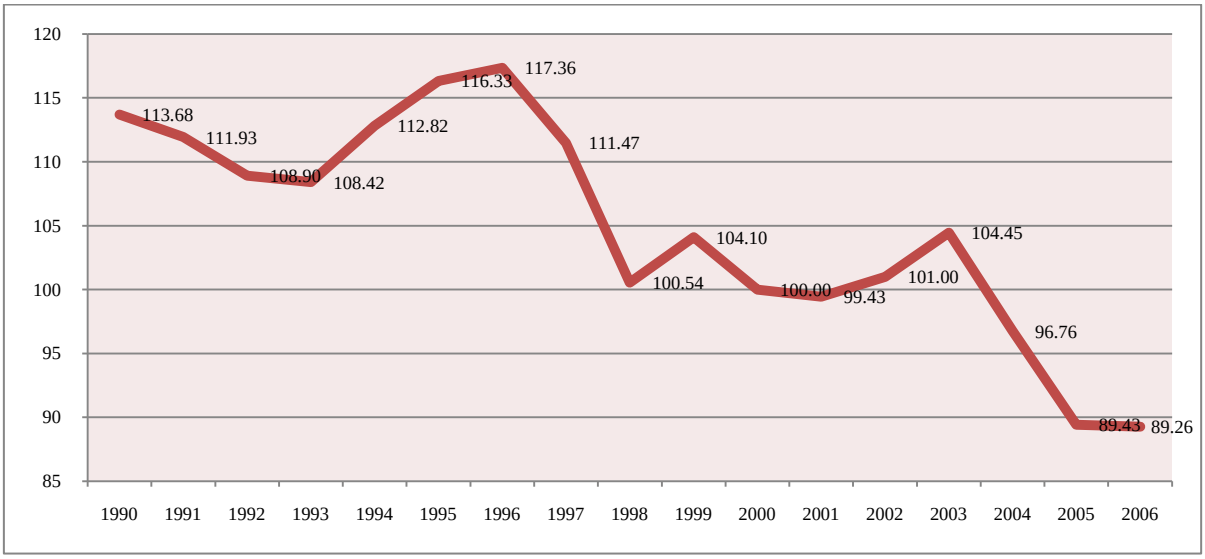
Figure 4.6 Ratio of real income of farm households to that of urban wage-earner households between 1990 and 2007



(Source: www.nso.go.kr)

A second predictor of the likelihood of people entering farming is terms of trade for farm households. Terms of trade are calculated by dividing farming income by farming costs, and the result is expected to be positively related to the number of young farmers. Figure 4.7 below shows that terms of trade for farm households have worsened and become more volatile. The dramatic decrease shown for 1997 and 1998 seems to be due to the IMF (International Monetary Fund) financial crisis.

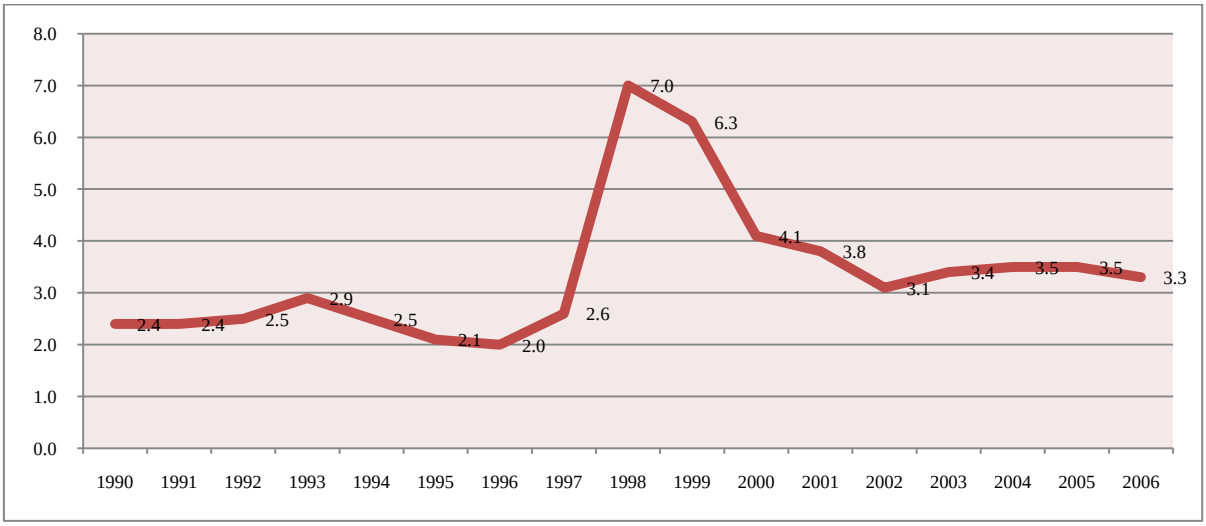
Figure 4.7 Changes in terms of trade for farm households by year between 1990and 2006



(Source: www.nso.go.kr)

A third predictor is the unemployment rate, which is expected to be positively related to the number of young farmers. The unemployment rate since 1990 is shown in Figure 4.8. The unemployment rate stayed at the level of 2% until 1997. It increased drastically in 1998, which was due to the IMF economic crisis; but it decreased to the level of 3% in the 2000s.

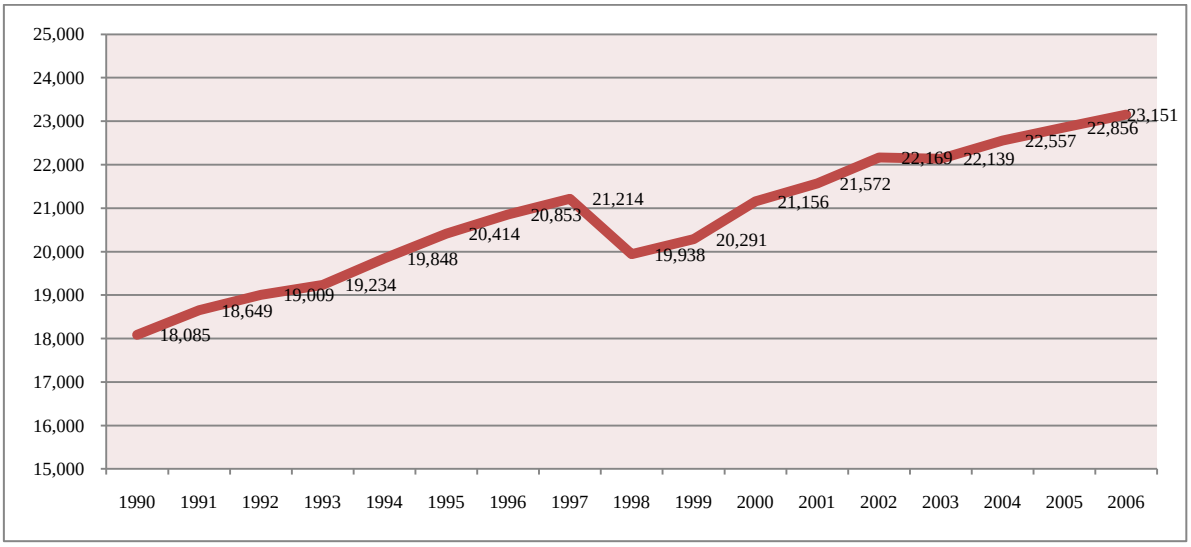
Figure 4.8 Changes in the unemployment rate between 1990 and 2006



(Source: www.nso.go.kr)

Fourth, the number of people in employment is expected to be negatively associated with the number of young farmers. Figure 4.9 shows that the number of people in employment has gradually increased, due to economic growth, except in 1998, when Korea faced the IMF economic crisis.

Figure 4.9 Numbers of people in employment by year between 1990 and 2006 (Unit: Thousands of people)



(Source: www.nso.go.kr)

The final predictor is the number of new farm entrants who are financed by the government, which is expected to be positively associated with the number of young farmers. The number of new farm entrants financed by the government is shown in Figure 4.1.

Table 4.1 Predictors in regression model for young farmers

Predictors	**Definition**	**Source**
Number of recipients	Number of prospective farmers financed by government	Ministry of Agriculture and Forestry

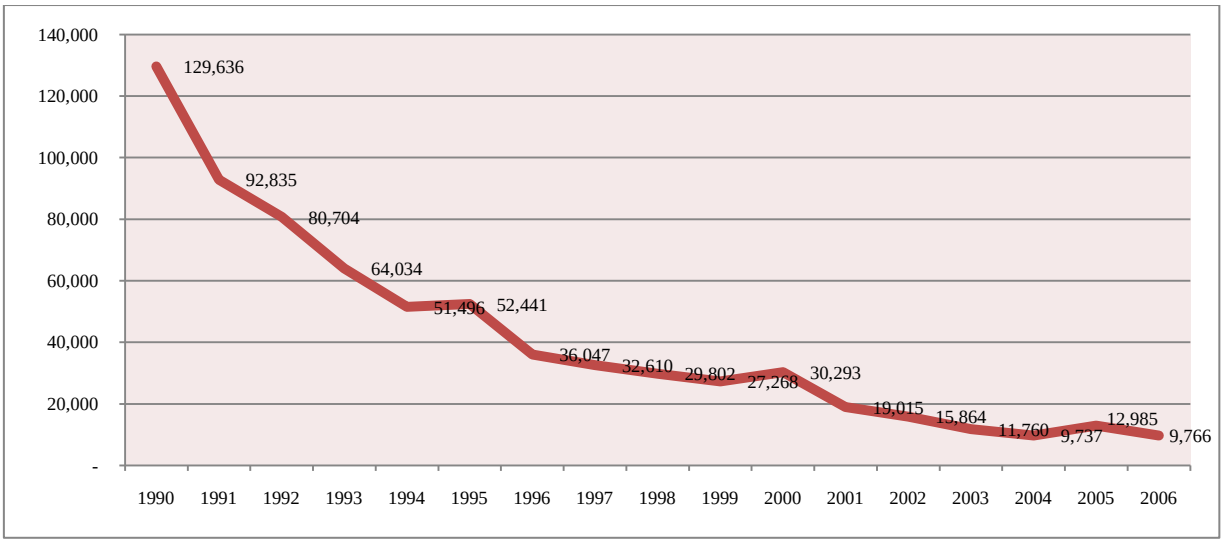
Ratio of real income between farm households and urban households	Difference between real income of farm households at 2000 prices and real income of urban wage-earner households at 2000 prices	National Statistics Office
Farm household terms of trade	Ratio of farm household receipts at 2000 prices to farm household purchases at 2000 prices	National Statistics Office
Unemployment rate	Annual unemployment rate published by the Bank of Korea	National Statistics Office
Number of people in employment	Total number of people who are in employment in each year	National Statistics Office
Number of new farm entrants	Number of prospective farmers financed by government	Ministry of Agriculture and Forestry

(Source: Own Figure)

Description of a dependant variable

The dependent variable, that is, the criterion variable, in this case is the number of young farm operators who are aged under 35. Figure 4.10 shows that the number of young farmers who are aged under 35 has continuously decreased, from 129,000 in 1990 to about 10,000 in 2006.

Figure 4.10 Numbers of young farmers aged under 35 by year between 1990 and 2006



(Source: www.nso.go.kr)

Regression equation

With the above mentioned five predictors and dependent variable, a multiple linear regression equation can be presented as the following equation (1). The equation shows that one unit of increase in X_i leads to β_i increase in Y'.

$$\acute{Y} = \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_0 \quad \text{---------- (1)}$$

$$LOG\ (\acute{Y}) = \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_0 \quad \text{---------- (2)}$$

(Here $\acute{Y}$ is the predicted number of young farmers under 35. And X_1 is the ratio between real farm household income and urban wage-earner household income, X_2 is the unemployment rate, X_3 is the number of people in employment, X_4 is farm household terms of trade, and X_5 is the number of new farm entrants)

Meanwhile, the above equation (2) shows the log-transformed multiple linear regression equation when the dependent variable is transformed into a natural log value by taking the natural log *(LN)* of each of the values. The equation indicates that a one-unit increase in X_i leads to an increase of *exp* (β_i) in $\acute{Y}$.

4.2.2.3 Results

A multiple regression analysis was conducted by enter method to evaluate how well the five influential variables predicted the numbers of young farmers aged under 35.

The dependent variable was log transformed to achieve normality and homogeneity of residuals (Figure B.1 in Appendix B). The VIF (Variation Inflation Factor) scores were less than 10 (Cohen et al., 2003), which indicated a lack of serious multicollinearity. The Durbin-Watson statistic (DW=1.837) and ACF (Autocorrelation Function) and

partial ACF plots (Figure B.2 in Appendix B) showed that the errors in the regression model were not correlated. The result is presented in Table 4.2.

Table 4.2 Summary of multiple regression analysis for variables predicting number of young farmers (N=17)

Model	**B**	**Beta**	**R**	**F**	**R^2**
(Constant)	9.060				
Number of people in employment	.000	-.907***			
Unemployment rate	-.055	-.217**			
New farm entrants	7.283E-5	.077			
Terms of trade	-.003	-.062			
Income ratio	.188	.046	.986	76.807***	0.972

**p<0.05, ***p<0.01

The linear combination of the variables was significantly related to the number of young farmers aged under 35, F(5,11)=76.807, p<.01. The multiple correlation co-efficient was .986, indicating that about 97.2% of the variance of the number of young farmers aged under 35 can be accounted for by the linear combination of the five predictors. And the regression equation is represented as follows.

$LOG\ (\acute{Y}) = .188*X_1 - .055*X_2 - .000*X_3 - .003*X_4 + 7.283E\text{-}5*X_5 + 9.060$

4.2.2.4 Observations

Multiple regression analysis shows that the number of new farm entrants, farm household terms of trade, and the income ratio between farm households and urban wage-earner households have no significant relationship with the number of young farmers aged under 35. But the number of young farmers was significantly related to the unemployment rate and the

number of people who were in employment, which implies that the number of young farm operators was influenced by labor market conditions in other economic sectors.

One unexpected result is that the unemployment rate has a negative relationship with the number of young farmers aged under 35. This means that the number of young farmers will decrease despite an increase in the unemployment rate. This leads us to ask why young people would willingly run the risk of being unemployed. This phenomenon can be explained by the theory of expected income maximization (Todaro, 1969). According to this theory, young people only try to get a non-farm job when they expect a greater income than they will get from a farm job. According to Kang (2004), one of the main factors which discourages young people from farming is the prospect of a low income from farming in the future, as well as a low income from farming in the present, and this result supports the argument just outlined. Therefore, it can be said that farm entry policy cannot significantly affect the number of young farmers, because farming is not preferred to a non-farm job.

4.3 The effect of agricultural structure adjustment policy on farm exit

4.3.1 Overview

Since 1991, agricultural structural adjustment policy has sought to induce old farmers to exit farming through farm exit policies like the direct payment for farmland transfer program and the creation of non-farm job opportunities (Section 3.3.4.2). However, the number of old farmers has increased. Does this, then, mean that the farm exit policy included within agricultural structural adjustment policy does not affect farm exit or the number of old farmers?

In this section, the effect of farm exit policy on the exit of old farmers is evaluated at policy

level. This is because analysis of the effect of relevant programs or projects on the number of old farmers is scarcely possible, due to these measures being closely related, and to a lack of available data.

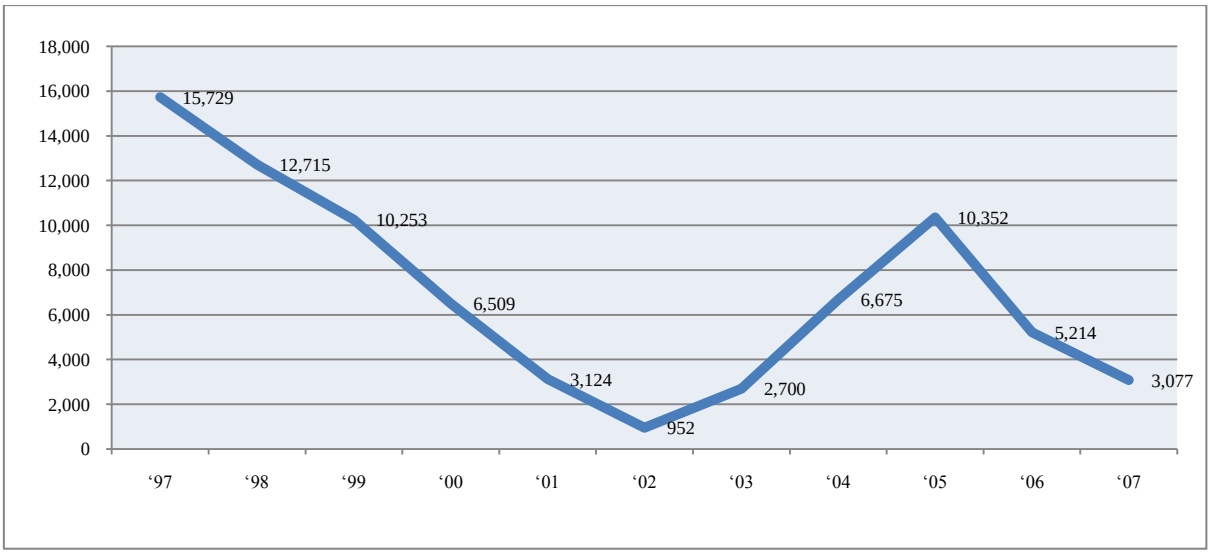
The effect of farm exit policy on the exit of old farmers is estimated in two ways. First, the effect of agricultural structural adjustment policy on the tendency of old farmers to exit is examined (Section 4.3.2), and this is estimated by investigating whether the number of farm retirees has increased or not, as well as whether there has been a difference in farm exit between age groups. Then, the effect of farm exit policy on the number of farmers aged 60 and over is examined (Section 4.3.3).

4.3.2 Analysis of the effect of agricultural structural adjustment policy on the farm exit of old farmers

4.3.2.1 Analysis of the number of farm retirees by year

Data on the number of old farmers who left farming with the support of the direct payment for farmland transfer program was analyzed. From 1997 to 2007, about 77,000 old farmers aged 60 and over exited farming. Figure 4.11 shows the number of farm retirees by year. The number of farm retirees was about 16,000 in 1997, but the number continued to decrease, reaching about 1,000 people in 2002. But from 2003, it increased, and reached 10,000 in 2005. But it started to decrease again from 2006. Like the trend in farm entrants, the trend in the number of old farmers who retired from farming shows fluctuation.

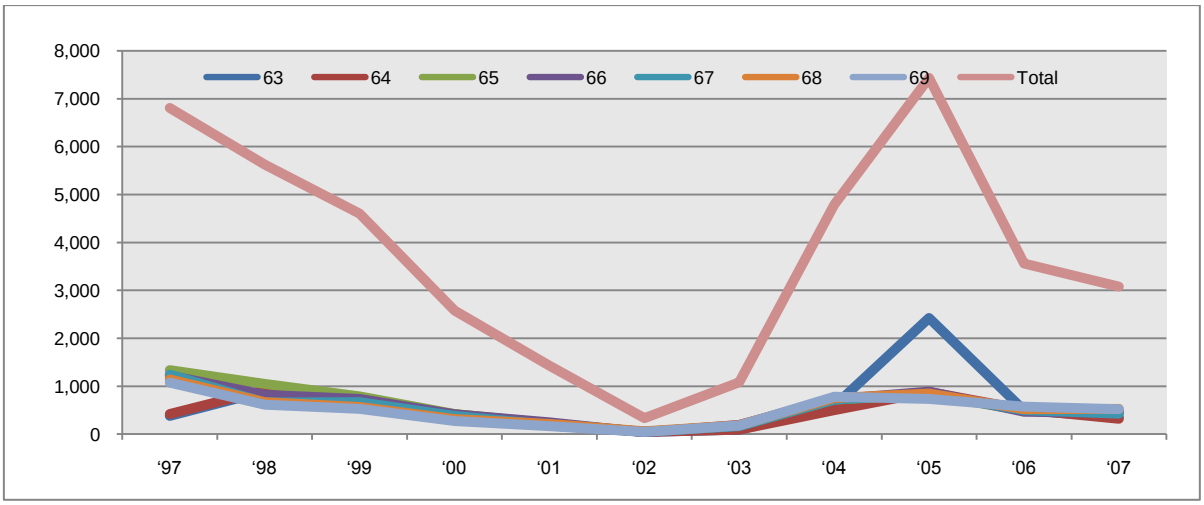
Figure 4.11 Number of farm retirees by year between 1997 and 2007



(Source: www.nso.go.kr)

Figure 4.12 below shows the number of farm retirees aged 63 to 69 between 1997 and 2007, and this reflects a more exact trend in the farm exit of old farmers by year than the total number of farm retirees in Figure 4.11. This is because the figures for farm retirees between 1997 and 2003 are for old farmers aged 60 and over; but the figures for farm retirees since 2004 show farmers aged 63 to 72, and the figures for 2007 show farmers aged 63 to 69. These changes in the figures are due to changes in the eligible age for the program. But the exit of old farmers aged 63 to 69 shows a similar pattern to that of the total number of farm retirees in terms of fluctuation, except as regards farmers aged 63 and 64.

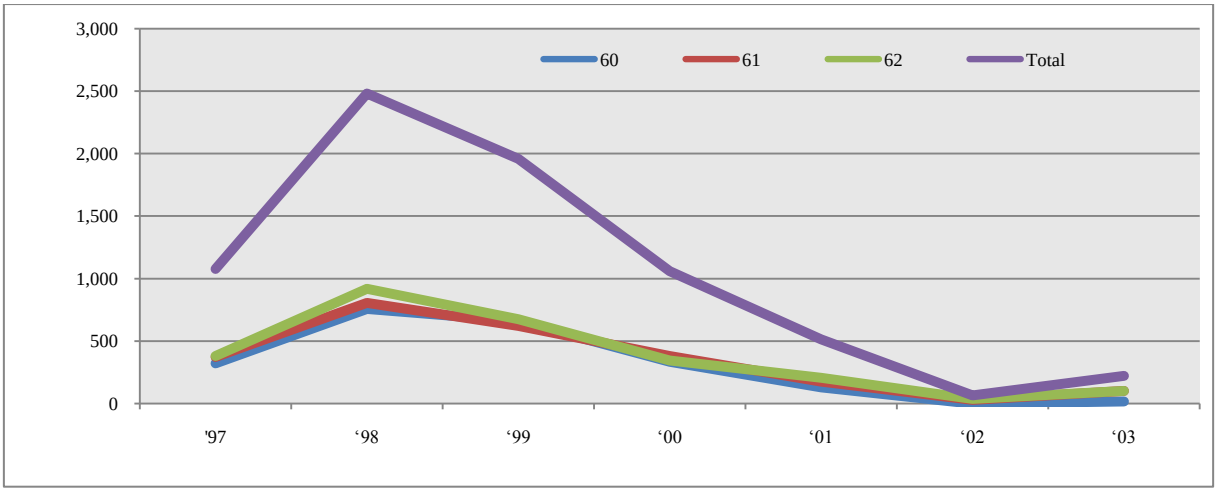
Figure 4.12 Numbers of farm retirees aged 63 to 69 by year between 1997 and 2007



(Source: www.nso.go.kr)

Figure 4.13 below shows the number of farm retirees aged 60 to 62 between 1997 and 2003. The graph shows a different pattern from that of Figure 4.11. The number of farm retirees increased for the first two years, but the increase turned into a decrease from the third year to sixth year.

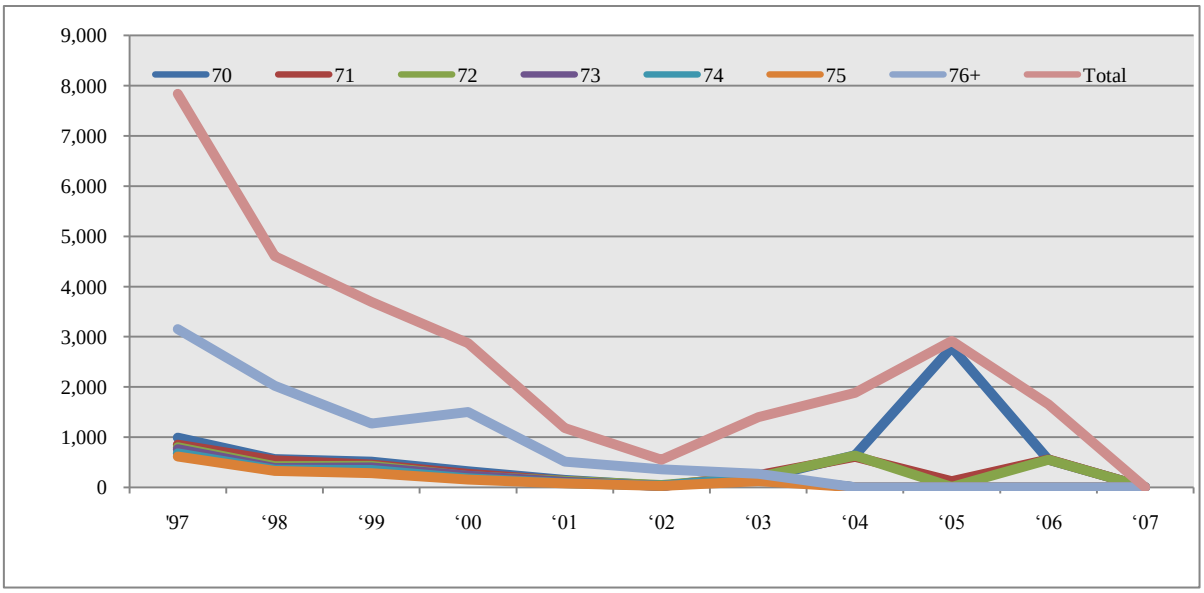
Figure 4.13 Numbers of farm retirees aged 60 to 62 by year between 1997 and 2007



(Source: www.nso.go.kr)

Figure 4.14 below shows the number of farm retirees aged 70 and over between 1997and 2006. The graph shows a similar pattern to that of Figure 4.11. But the numbers of farm retirees aged 71 and 72, show different patterns from those of Figure 4.11.

Figure 4.14 Numbers of farm retirees aged 70 and over by year between 1997 and 2007



(Source: www.nso.go.kr)

To sum up, the numbers of farmers leaving farming at the age of 60 and over show fluctuating patterns and trends between 1997 and 2006. This supports the argument that the number of farm retirees did not increase after 1997, although number of old farmer increased, and thus farm exit policy does not seem to have been so effective in inducing more and more old farmers to exit farming.

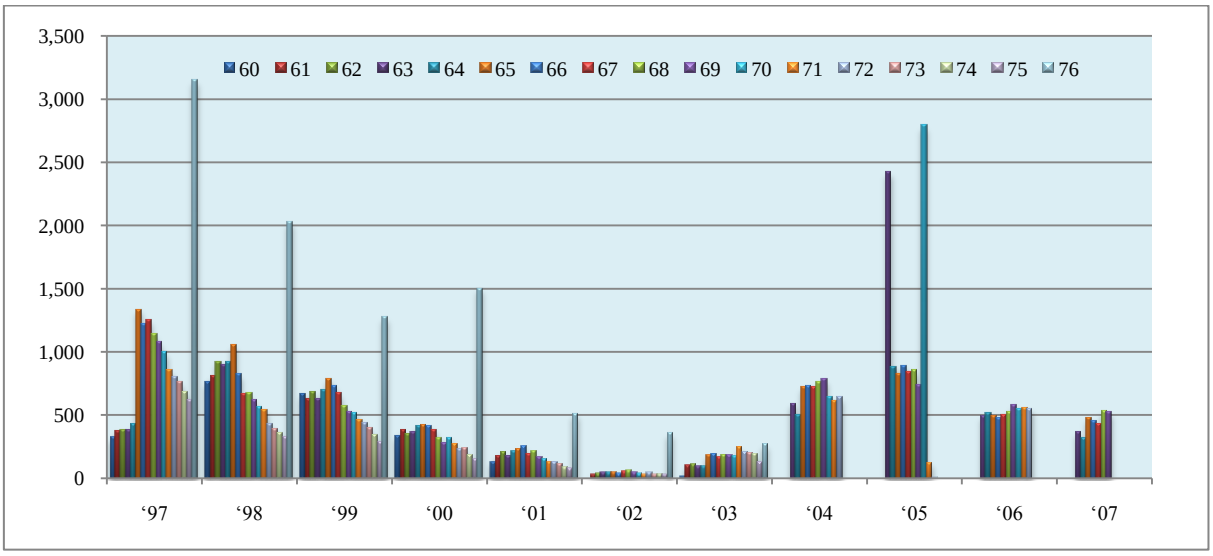
The following section discusses whether there is a difference in the probability of farm exit between the different ages on the basis of the above data.

4.3.2.2 Analysis of farm retirees by age

Data and method

Figure 4.15 below shows the number of farm retirees by age and by year from 1997 to 2007. The number of farm retirees shows a convex shape between 1997 and 2004, when the number for farmers aged 76 and over was excluded. This means that most farmers retire from their farms in their mid sixties. But the numbers of farm retirees by age since 2005 shows an irregular pattern.

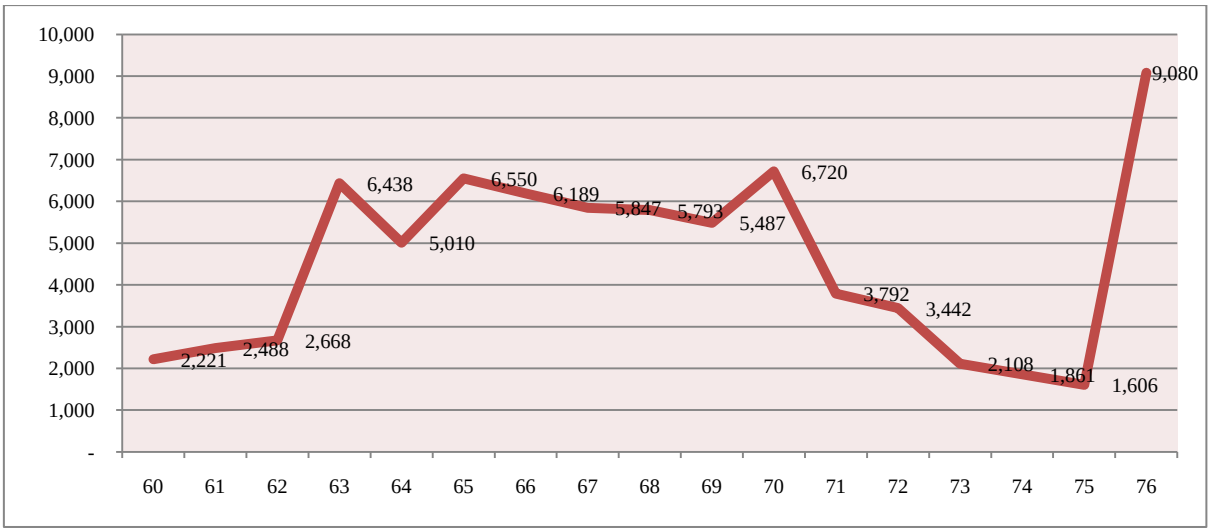
Figure 4.15 Numbers of farm retirees aged 60 and over by year from 1997 and 2007



(Source: www.nso.go.kr)

Figure 4.16 below shows the number of farm retirees by age between 1997 and 2006. The graph shows a convex shape, which is partly because the ages of 60 to 62 and over 72 were not included in the number of farm retirees after 2004, and the ages of 70 to 71 were not included in the number of farm retirees after 2007.

Figure 4.16 Numbers of farm retirees by year and by age between 1960 and 1976



(Source: www.nso.go.kr)

It is necessary to compare the probability of farm exit between the different ages to know which age is the most likely for farm exit. The probability of farm exit at a particular age is calculated by dividing the number of farm retirees of that age by the number of people in the population of that age. Meanwhile, although figures for the numbers of farm retirees by age from 1997 to 2007 are available, figures for the population as a whole by age are available only for 1998, 1999, 2000, 2001, and 2005 because meta-data on the population by age in 1996, 1997, 2002, 2003, 2004, and from 2006 to 2007, were not published by the National Statistics Office. So, only the probabilities of farm exit between 1998 and 2003 and in 2006 can be calculated.

The age group 60 and over is classified into four categories: the early sixties (Group Ⅰ, 60 to 64), the late sixties (Group Ⅱ, 65 to 69), the early seventies (GroupⅢ, 70 to 74), and the late seventies (GroupⅣ, 75 and 76 and over). These categories are used to compare the probability of farm exit between the different age groups.

Each age group has eight (GroupⅣ) to 25 (GroupⅡ) cases of probability of farm exit. For example, GroupⅡ has 25 cases of probability of farm exit, because five ages (65, 66, 67, 68, and 69) are included in this group, and each age has data for five years (1999, 2000, 2001, 2002, 2006). This data set is compared with data sets for the other groups in order to investigate whether the probability of farm exit between the two groups differs or not.

A Mann-Whitney U test was conducted to compare the probability of farm exit between ages instead of ANOVA. This is because a Shapiro-Wilk test showed that some data sets were not normally distributed. The independent variable was the age group, and the dependant variable was the probability of farm exit.

Results

The results of the Mann-Whitney U test showed that there was no significant difference between GroupⅠ and GroupⅡ (z=-1.092, p=.275), between GroupⅠ and GroupⅢ (z=-1.328, p=.184), between GroupⅠ and GroupⅣ (z=-1.317, p=.200), between GroupⅡ and GroupⅢ (z=-.464, p=.642), between GroupⅡ and GroupⅣ (z=-.630, p=.550), between GroupⅢ and GroupⅣ4 (z=-.451, p=.674). These results mean that there is no significant difference in the probability of farm exit between the ages for five years.

4.3.2.3 Observations

The following two points emerge from the above analyses.

The numbers of farm retirees has not increased, although farming circumstances like farm household terms of trade, which was shown in Figure 4.7, have worsened (Section 4.3.2.1).

There was no significant difference in the probability of farm exit between the different ages (Section 4.3.2.2), which means that farm exit has no relationship with age in Korea. This contradicts the argument that the probability of retirement will increase as farmers' age increases (Kimhi and Nachlieli, 2001; Tietje, 2004) or that the two are in a negative relationship (Väre, 2006; Pietola et al., 2003).

So, there is scarcely any evidence to be found that farm exit policy, as part of the Korean agricultural structural adjustment policy, affects the exit of old farmers. One of the reasons for this is that old farmers do not want to leave farming (Park and Jung et al., 2000; Jung and Min et al., 1997), despite the fact that the government provides them with economic incentives. And although the government has tried to make older farmers exit farming, this has not been effective because older farmers are no more likely than younger ones to exit farming.

4.3.3 The effect of agricultural structural adjustment policy on the number of old farmers

4.3.3.1 Overview

One of the aims of Korean agricultural structural adjustment policy has been to make old farmers, who are thought to be of marginal use to the economy, exit farming by creating non-farm job opportunities for them, as well as by providing economic incentives for retirement. As was seen in Section 4.3.2, farm exit policy does not seem to affect farm exit. In this section, the effect of agricultural structural adjustment policy is investigated by considering the effect of other external circumstances on farm exit.

Theoretically, whether farmers continue farming or not, that is whether they opt for farm exit, is affected by external circumstances, like the income differential between farm households

and urban households (Ranis and Fei, 1961), the profitability of farming (Foltz, 2004; Pietola and Väre, 2003), the unemployment rate (Foltz, 2004), and employment opportunities. Therefore this section discusses how well agricultural structural adjustment policy predicts the number of old farmers of 60 and over when considering these factors.

4.3.3.2 Data and method

A multiple regression analysis method was used to evaluate how successfully farm exit policy predicted the number of old farmers when other influential variables were simultaneously included in the model.

In the model, the number of farm retirees, which represents the effectiveness of farm exit policy, as well as the income ratio between farm households and urban wage-earner households, farm household terms of trade, and farm population per farm household, were used as predictors. But, the number of farm employees and the unemployment rate were not included. This was because old farmers are not thought to compete with young people in the labor market, due to the difference in age and in the human capital they represent. One dependant variable was the population of farmers aged 60 and over.

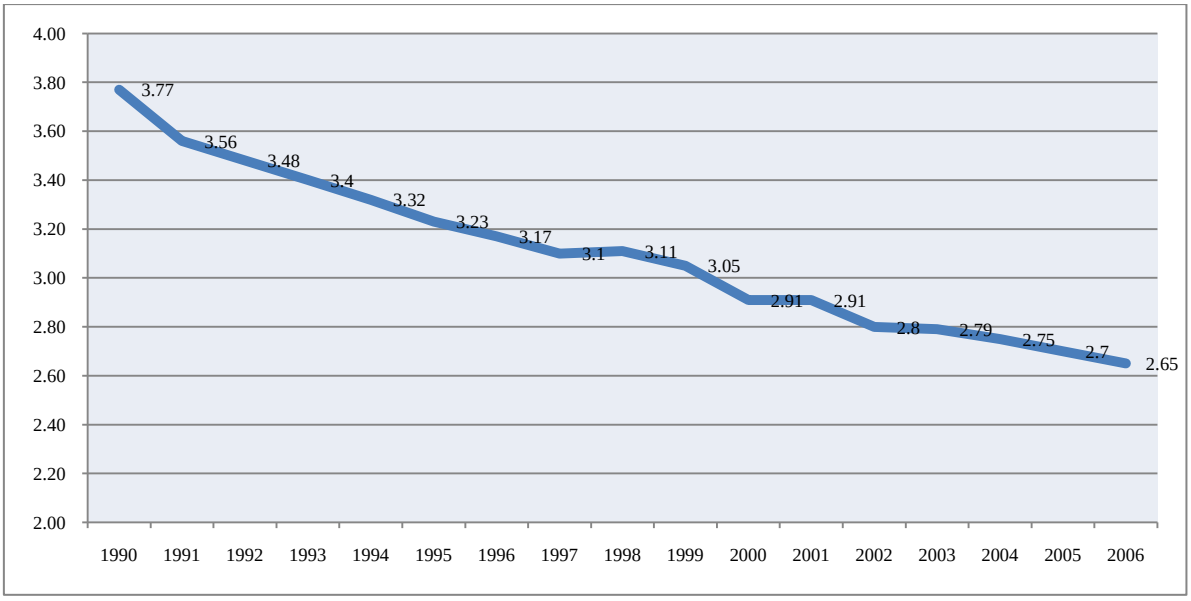
Description of predictors

First, the ratio of farm household income to urban wage-earner household income was shown in Figure 4.6. It is expected that the ratio of farm household income to urban wage-earner household income is positively associated with the number of old farmers.

Second, farm household terms of trade have already been shown in Figure 4.7. These are expected to be positively associated with the number of old farmers.

Third, another predictor is farm population per farm household, which represents the amount of labor available to the farm household. This was chosen as a predictor according to the argument that farm exit is delayed as the number of family members increase (Väre, 2006; Stiglbauer and Weiss, 2000; Kimhi and Bollman, 1999). Figure 4.17 shows farm population per farm household between 1990 and 2006. Farm population per farm household has been in continuous decline since 1990. It was 3.77 persons in 1990 and this decreased to 2.65 persons in 2006. It is expected that farm population per farm household is negatively associated with the number of old farmers.

Figure 4.17 Farm population per farm household by year between 1990 and 2006



(Source: www.nso.go.kr)

Finally, the other independent variable was the number of farm retirees who retired from farming with the help of the early farm exit program, which is shown in Figure 4.11. This is thought to be negatively associated with the number of old farmers. The definition and sources of predictors are summarized in Table 4.3.

Table 4.3 Predictors in regression model for old farmers

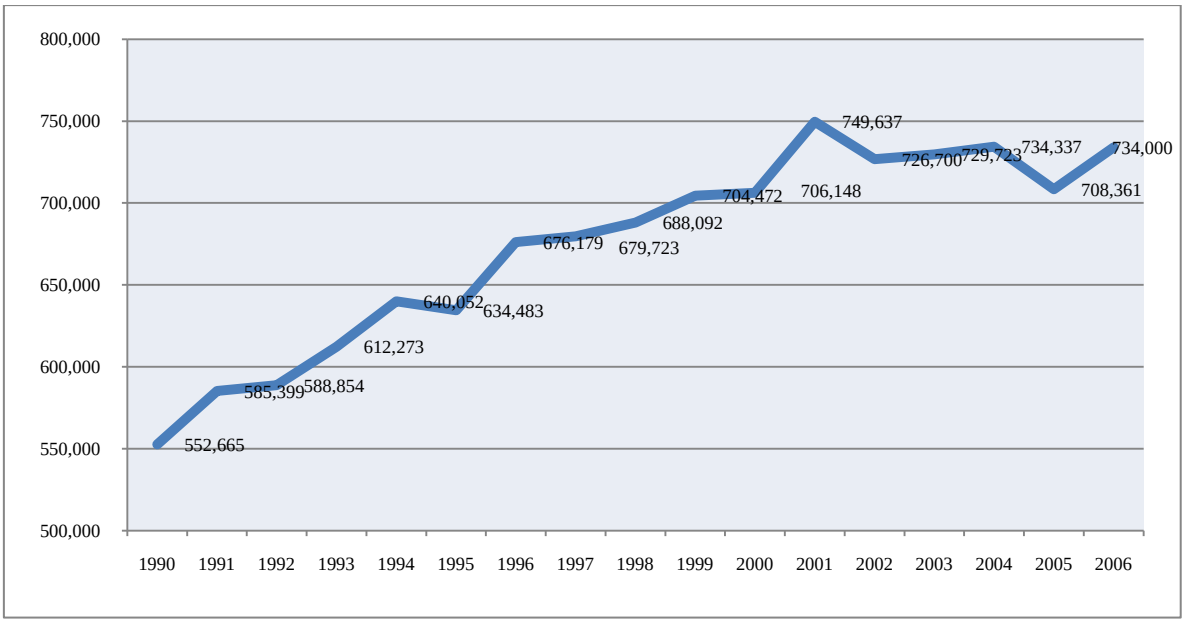
Predictors	Definition	Source
Number of farm retirees	Number of old farmers who exited farming through the system of direct payment for farmland transfer program (1997-2006)	Ministry of Agriculture and Forestry
Ratio of farm household income to urban wage-earner household income	Ratio of farm household income to urban wage-earner household income at 2000 prices (1997-2006)	National Statistics Office
Farm household terms of trade	Ratio of farm household sales price index at 2000 prices to farm household purchase price index at 2000 prices (1997-2006)	National Statistics Office
Farm population by farm household	Number of people obtained by dividing farm population by number of farm household (1997-2006)	National Statistics Office

(Source: Own table)

Description of a dependent variable

The dependent variable, that is the criterion variable, is the number of old farmers who are aged 60 and over. The number has been gradually increasing since 1990, as is seen in Figure 4.18. It was about 552,000 in 1990 and reached 749,000 in 2001, but was about 734,000 in 2006.

Figure 4.18 Number of old farmers aged 60 and over by year between 1990 and 2007



(Source: www.nso.go.kr)

Regression equation

With the above four predictors and a dependent variable, the multiple linear regression equation is presented as follows (3).

$$\acute{Y} = \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_0 \text{ ---------- (3)}$$

$$LOG\ (\acute{Y}) = \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_0 \text{ ---------- (4)}$$

(Here $\acute{Y}$ is the predicted number of old farmers, X_1 indicates the farm population by farm household, X_2 indicates farm household terms of trade, X_3 indicates the number of farm retirees, and X_4 indicates the ratio of farm household income to urban wage-earner household income.)

Meanwhile, the above equation (4) shows multiple linear regression equations when the dependent variable is transformed into a natural log value by taking the natural log *(LN)* of

each of the values. The equation indicates that a one-unit increase in X_i leads to an increase of *exp* (β_i) in *Ý*.

4.3.3.3 Result

A multiple regression analysis was conducted by enter method to evaluate how well these variables predicted the number of old farmers aged 60 and over.

The dependent variable was log transformed to achieve normality and homogeneity of residuals (Figure B.3 in Appendix B).The VIF (Variation Inflation Factor) scores were less than 10 (Cohen et al., 2003), which indicated a lack of serious multicollinearity. Durbin-Watson statistic (DW=2.198) and ACF (Autocorrelation Function) and partial ACF plots (Figure B.4 in Appendix B) showed that the errors in the regression model were not correlated.

The result of the multiple regression analysis is shown in Table 4.4. The linear combination of the variables was significantly related to the number of old farmers aged 60 and over, F (4, 12) = 45.924, p<.01. The multiple correlation co-efficient was .969, indicating that about 93.9% of the variance in the number of the old farmers was explained by the linear combination of predictors.

Table 4.4 Summary of a multiple regression analysis for variables predicting the number of old farmers (N=17)

Model	**B**	**Beta**	**R**	**F**	**R^2**
(Constant)	6.143				
Farm population per farm household	-.115	-.931***			
Income ratio	.001	.254			
Terms of trade	-.104	-.221			

Number of farm retirees	5.409E-7	.070	.969	45.924***	0.939

***p<0.01

According to B weights, the regression equation is represented as follows.

$LOG\ (\acute{Y}) = -.115*X_1 - .104*X_2 + 5.409E\text{-}7*X_3 + .001*X_4 + 6.143$

4.3.3.4 Observations

Of the four predictors, only farm population per farm household was a significant predictor, which means that if farm population per farm household decreases, the number of old farmers increases. It can be explained as follows. The farm population has decreased, due to the decrease in young family members and their spouses, and therefore farmers have less opportunity to transfer their farmland to their children. Under these circumstances, old farm operators have to continue farming and make up for the loss of labor by increasing mechanization or reducing their farm size. Therefore, the number of old farmers increases when compared with the case where old farm operators exit farming by transferring their farmland to their children.

Meanwhile, other variables like the ratio of real income between farm households and urban wage-earner households and farm household terms of trade were not associated with farm exit, which indicates that the number of older farmers is not affected by current economic conditions in farming. And the number of farm retirees did not prove to be a predictor of the number of old farmers, which means that farm exit policy does not affect the number of old farmers.

Why, then, does agricultural structural adjustment policy not prevent an increase in the number of old farmers? It seems that this is partly due to the smaller amount of subsidy being

made available. As of 2006, only about 3 million KRW has been paid per ha of rice field when old farmers exit farming. Accordingly, old farmers seem to continue farming because they expect to get a bigger income from farming than from the subsidy. In addition, the low probability of getting a non-farm job in a rural area is the other cause of this phenomenon (Park, 2004), although the government has created non-farm job opportunities through the rural development policy.

4.4 Summary and conclusion

In this chapter, the extent to which agricultural structural adjustment policy, especially farm entry and exit policy, affects farm entry and exit was investigated, and the results are as follows.

In the case of the farm entry of prospective farmers, it was shown that agricultural structural adjustment policy did not prevent a decrease in new farm entrants as well as in the number of prospective farmers (Section 4.2.1) although the ratio of farm entrants in their twenties increased in the 2000s from the 1990s (Section 4.2.1.3), and the ratio of farm entrants who have higher education, like college and university qualifications, has increased since 1990 (Section 4.2.1.4). And it was also proven that the number of new farm entrants did not affect the number of young farmers (Section 4.2.2). The above results indicate that the farm entry of prospective farmers as well as the number of young farmers is not determined by agricultural structural adjustment policy, especially farm entry policy.

In the case of farm exit by older farmers, it was shown that the number of farm retirees has decreased (Section 4.3.2.1), although farming circumstances have worsened (Figure 4.6 and Figure 4.7), and the probability of farm exit by older farmers was not different from that to be

expected of younger farmers (4.3.2.2). In addition, the number of farm retirees did not affect the number of old farmers aged 60 and over (Section 4.3.3). These results indicate that the farm exit of old farmers is not affected by structural adjustment policy, especially farm exit policy.

In conclusion, it is proved that agricultural structural adjustment policy is not thought to affect farm entry and exit (Kim and Lee, 2000; Lee et al., 2004) and, therefore, agricultural structural adjustment policy does not stop the trend towards a decrease in young farmers and an increase in old farmers. As is seen at section 1.2, one of the possible explanations for this is that the effect of farm entry and exit policy is restricted by the government's competitiveness policy or its rural development policy; or other external circumstances of farm entry and exit like farming conditions, reduce the effect of farm entry and exit policy. But whether or not the effect of farm entry and exit policy is restricted by other relevant policies, or by external circumstances, cannot be estimated, due to an insufficiency of existing data. Therefore, the following chapters will describe how a research method was established to overcome this problem and give a valid result.

CHAPTER 5

A TYPOLOGY OF PROSPECTIVE FARMERS AND OLD FARMERS

5.1 Introduction

As was seen in Section 2.4, earlier studies on farm entry and farm exit focused mainly on the demographic and socio-economic characteristics of farmers and their effects on farm entry and exit. However, another personal characteristic of farmers, – that is their type – could, among other characteristics, contribute to the development of farm entry and exit studies and to improving the effect of agricultural structural adjustment policy by opening up a new field which has not been investigated by other researchers.

Therefore, this chapter aims to define types of prospective farmers and types of old farmers on the basis of the theoretical background, and to consider the effect of type on farm entry and exit and its expected contribution to farm entry and exit studies.

The chapter is developed as follows. As an approach to a typology of farmers, studies on personality are briefly described, models of farm entry and exit studies are reviewed, and an appropriate model of farm entry and exit studies in Korea is discussed (Section 5.2). Then, types of prospective farmers (Section 5.3.1) and types of old farmers (Section 5.3.2) are defined, and the anticipated effect of this typology on farm entry and exit is discussed. Finally, the expected contribution of a typology and the conclusion of the chapter are presented in Section 5.4.

5.2 Approach to a typology of farmers

5.2.1 Overview

Personality is ‘a dynamic organisation, inside the person, of psychophysical systems that create a person’s characteristic patterns of behaviour, thoughts, and feelings’ (Carver and Scheier, 2000: p.5). Although personality is a complex construct (Smith and Vetter, 1982), it helps us predict, understand and change our behavior (Shultz and Shultz, 2008; Ryckman, 2004; Carver and Scheier, 2000; Lastovicka and Joachimsthaler, 1988), and it also determines his [man’s] unique adjustment to the environment (Eysenck, 1970: p.2).

There are many different kinds of theories and perspectives on personality. A study of a personality typology, for example the Type Indicator of Meyers and Briggs (1986), is one of the popular subjects of personality studies, although typologies are criticized due to problems that arise with using them to predict personality disorder (Furnham and Crump, 2005) and problems of measurement (Pittenger, 1993) arising from a deficiency in their theoretical basis.

Despite the above mentioned criticisms, a typology is a useful way of predicting and changing behavior, but one that has not so far been applied to the study of farm entry and exit. Therefore, this study aims to establish a typology of farmers, overcoming the criticisms of other typologies by establishing a theoretical basis for it.

Sections 5.2.2 to 5.2.4 are devoted to defining a model of farm entry and exit as a theoretical basis for defining a typology of farmers. Earlier models of farm entry and exit are reviewed, and perspectives on farm entry and exit in Korea are discussed. Then, an appropriate model is defined.

5.2.2 Review of models of farm entry and exit

What makes prospective farmers enter farming and old farmers exit? When studying farm entry and exit, two points – motive, and subject and level of decision-making – have been the

main basis of analysis.

Farmers' motives for doing farm work are relevant to a theoretical explanation of their farm entry and exit. As was seen in Section 2.2, the income differential model (Ranis and Fei, 1961; Jorgensen, 1961), the expected income maximization model (Todaro, 1969), and the utility maximization model (Stark and Lucas, 1988; Stark, 1982) offer examples of this.

The other concern is the subject and level of decision-making on farm entry and exit. The studies of Ranis and Fei (1961), Jorgensen (1961), and Todaro (1969) modeled outward migration from rural areas at the level of the individual. But, Stark (1982), Stark and Lucas (1988), and Kimhi (1994) modeled it at a family level.

The theoretical models of farm entry and exit mentioned above, like the wage differential model, the expected income differential model, and the maximization of present value of farm family income model, can be classified, as in Table 5.1, by motive for farm entry and exit and subject and level of decision-making.

Table 5.1 Motive and level and subject of decision-making, for farm entry and exit

Classification		Level and Subject	
		Individual	Family
Motives	Income	-Wage differential model -Expected income differential model	-Maximization of present value of farm family income
	Utility	-	-Maximization of value of family farm -Maximization of family utility

(Source: Own Table)

It is important to select an appropriate model of farm entry and exit for our study because one theory cannot be applied to all cases in all countries, and what is more, the circumstances

surrounding farm entry and exit change as time goes on. For example, in a country which has a tradition of farm succession among family members, researchers are more likely to analyze entry and exit at family level than at individual level. Therefore, the following two questions should be answered in order to analyze farm entry and exit in Korea: What intrinsic attributes of farming make young people want to do farming or old farmers want to leave farming? And is their farm entry or farm exit for themselves, or for their families?

5.2.3 Perspectives on farm entry and exit in Korea

5.2.3.1 Motives

It seems that farming has less appeal than non-farm jobs to prospective farmers and to old farmers because of its unfavorable economic and social conditions (Kang, 2004). This was obvious to me when I had plenty of opportunity to meet prospective farmers who were attending agricultural schools and their families, during the period when I was responsible for overseeing farm entry at the Ministry of Agriculture and Forestry from 2003 to 2004.

That many old farmers do not want to continue farming is mainly due to low profit and hard working conditions. According to Park (2004), in the case of old farmers, 80% of them felt that farming was hard and difficult at a time when they were becoming less capable of hard farming work, although they had no choice but to do farming for economic reasons, as well as to keep their farms in the family.

Also, they did not want their children to do farming because they did not want their sons to undertake hard and difficult work which would bring them a lower income and social standing than a non-farm job. Nor, for the same reason, did these farmers' sons and other prospective farmers want to be farmers if they could get another job. They even considered

that they would have difficulty getting married if they went in for farming in a rural area, because they felt young girls did not like farmers who lived in rural areas where the quality of life was worse than in urban areas. And, in fact, living conditions, like education, medical treatment, and culture in rural areas are inferior to those in urban areas (MAF, 2006).

However, many empirical studies show that farm entry and exit cannot be reduced to an economic aspect, like farming income. According to Kang (1997) and Kang (2004), the reason that prospective farmers do not want to engage in farming was mainly related to the fact that they saw farming as a discouraging prospect; although these research studies also showed that the factors which discouraged them were lower income from farming than from non-farm jobs, or the income differential between sectors. And according to Ahn (2001), the inferior living conditions in rural areas as well as a shortage of farming necessities like capital, farmland, and farming skills were the main obstacles to farm entry.

Meanwhile, the reasons that prospective farmers considered they would select farming as a job were different from those which discouraged them from doing farming. Kang (2004), having made a survey of farmers, found that rural amenity was a major factor in inducing young people to do farming, irrespective of age and farming career. When classifying the survey results by the age of farmers, the ratio of answers that they were engaged in farming because they liked to live in a rural area or at home was highest for people who were aged under 30 and those who were aged from 50 to under 60; the ratio of answers that they did farming because they liked to live in a rural area or they thought that farming would give them more income were highest for people aged 30-39 and 40-49; and the ratio of answers that they selected farming because they liked to live in a rural area or they had fewer years of schooling were highest for people over 60. When classifying the survey result by farming

careers, the ratio of answers that they selected farming because they liked to live in a rural area or they liked to live at home or they expected more income from farming was high in most age groups. And the ratio of farmers who answered that they were engaged in farming because they were the oldest son of a farmer was highest among farmers who had done farming work for 26 years or more.

Na (2004) et al. found that the motives that caused prospective farmers to do faming were that it allowed them to realize their values, that they had a preference for living in a rural area, that they were expecting to benefit from farm succession, that they had an aptitude for farming, that they thought that farming had prospects, and that they thought they would be able to get only a low income from a non-farm job. Of these motives, preference for living in a rural area and realization of their values had the highest ratios.

In conclusion, it seems that there is little possibility that the income-based model can be applied to the case of farm entry and exit in Korea. This is because the socio-cultural aspects of farming as well as farming income were major factors which affected farm entry and exit.

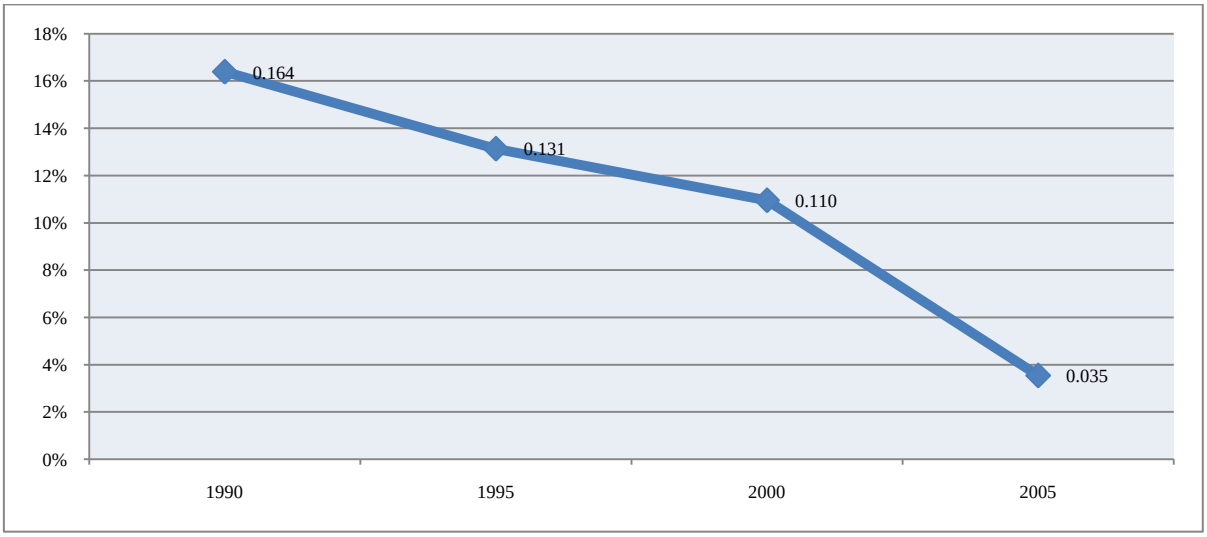
5.2.3.2 Analysis level

Research studies which adopt family level analysis (Stark and Lucas, 1988) consider job selection by family members as a part of a family's business. These research studies explain farm entry or farm exit from the perspective of a contract among family members. That is, family members help young people settle in an urban area and get a non-farm job; and then the young people transfer their income to their family to use for enlarging their farmland or increasing the value of the farming property in other ways.

If this is a true picture, can this model be applied to the case of Korea? The conclusion of this

study would be that it cannot be applied to the cases of farm entry and exit in Korea, and the evidence for this is as follows. First, a perspective that analyzes farm entry and exit at family level expects farmland to be passed from parents to their children. So, since a family farm is not a prominent feature of farm management, it is hard to apply this model to Korea. Unlike the United Kingdom, which has a tradition of family farms (Lobley, 2010), family farms are not a traditional farm management style in Korea, despite the fact that the Korean government has tried to promote family farms since the 1990s (Kim et al., 2000). The ratio of old farmers who had successors was about 16% in 1990, but it decreased to 3% in 2005 (Figure 5.1). This meant that, as of 2005, it was expected that only about three out of every 100 farm households could expect to pass their farmland to their children.

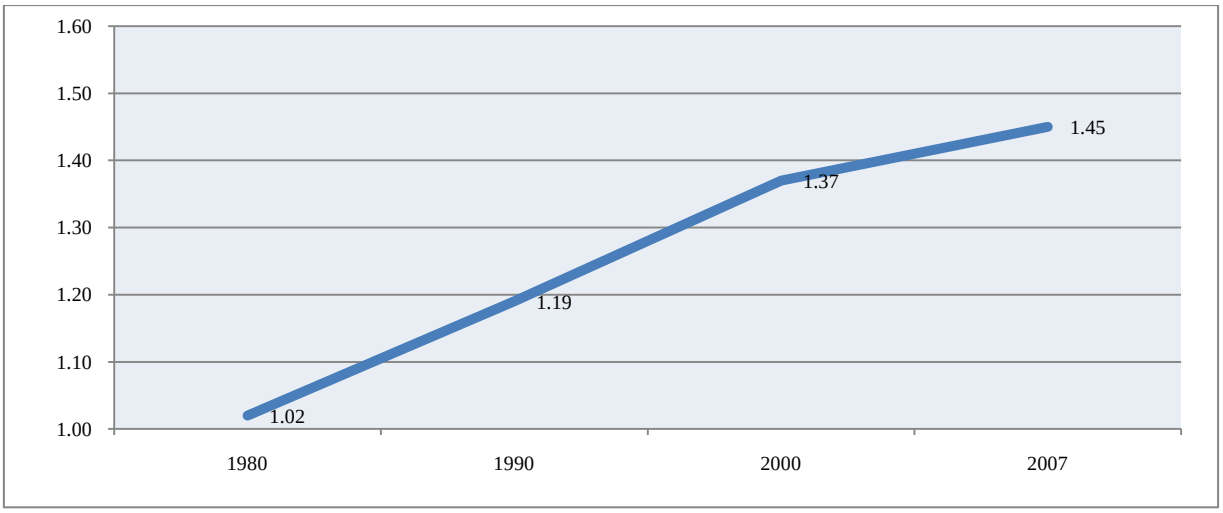
Figure 5.1 Ratio of old farmers with successors



(Source: www.nso.go.kr)

Also, the average amount of farmland per farm household is not so great as to attract young people to manage their family farms. According to the National Statistics Office (2008), the average size of cultivated land per farm household has been 1ha-1.5ha since 1980 (Figure 5.2).

Figure 5.2 Average size of cultivated land per farm household (ha)



(Source: www.nso.go.kr)

The farming income which can be obtained from 1ha to 1.5ha is only about 10,000 thousand KRW a year (Table 5.2). But the annual average wage of urban wage-earner households in 2007 was about 32,000 thousand KRW (NSO, 2008), which was about three times as much as that of farm households.

Table 5.2 Farm income by size of farmland (KRW)

Size of farmland	Farm income	Gross receipts	Farm expenses
Under 0.5ha	3,374,063	10,376, 885	7,002,821
0.5 ~ 1 0	5,167, 25	13,35 ,434	8,192,010
1.0 ~ 1 5	10,202,366	22 474,942	12,272,576
1.5 ~ 2.0	13,736,881	29,231,223	15,494,341
2.0 ~ 3.0	17,405,721	35,862,927	18,457,207
3.0 ~ 5.0	22,086,261	49,295,393	27,209,132
5.0 ~ 7.0	19,927,450	46,671,174	26,743,725
7.0 ~ 10.0	28,237,133	65,366,234	37,129,101
10.0ha and over	40,310,335	88,833,743	48,523,409

(Source: www.nso.go.kr)

Remittances from children to their families on farms was 314,000 KRW in 2002, which is only about 1.3% of farm household income, as can be seen in Table 5.3. Such a small amount

of transferred money cannot enable parents to enlarge their farmland.

Table 5.3 Ratio of income transferred by family members

Classification	1990	1995	2000	2002
Farm household income(A)	11,025,781	21,802,558	23,072,123	24,474,620
Income transferred by family members(B)	483,880	706,158	390,291	314,194
Ratio(B/A)	4.39%	3.24%	1.69%	1.28%

(Source: www.nso.go.kr)

The above facts suggest that an individual level analysis of farm entry and exit is more appropriate in the case of Korea than a family level analysis.

5.3 A typology of farmers

In the following sections, types of prospective farmers and types of old farmers will be defined on the basis of the analysis models which have been chosen for the reasons discussed above.

5.3.1 Prospective farmers

5.3.1.1 Assumptions

First, prospective farmers expect to maximize the utility of their careers.

Second, prospective farmers expect to engage in either farming or a non-farm job as full time workers. So, prospective farmers cannot get two different kinds of job at the same time: the alternatives are entering farming or staying out of farming.

Finally, the utility of a job is determined by the income it yields, the quality of life it provides, and its social and vocational standing.

5.3.1.2 Utility function of prospective farmers

According to assumptions (1) and (3), the utility function of prospective farmers can be presented as equation (1) below. Here, p_j stands for the probability of getting a job.

$$E(U) = f\,[U(Income_j, Quality\ of\ life_j, Social\ standing_j), P_j] \text{ ---------- (1)}$$

Equation (1) demonstrates that the expected utility of prospective farmers' jobs is determined by the income, living conditions, and social and vocational standing they are likely to enjoy, and it is also subject to the probability of getting a job. Therefore, if the probability of getting a job is zero, the expected utility from such a job will be zero.

The expected utility functions which are derived from farming and from non-farm jobs are represented as equations (2) and (3) respectively.

$$E\,(U)_{farming} = f\,[(Income\ from\ farming, Quality\ of\ life\ in\ rural\ areas, Social\ standing\ of\ farming), P_j] \text{ --------- (2)}$$

$$E\,(U)_{non\text{-}farm\ job} = f\,[(Income\ from\ non\text{-}farm\ job, Quality\ of\ life\ in\ urban\ areas, Social\ standing\ of\ non\text{-}farm\ job), P_j] \text{ ------ (3)}$$

It is obvious that prospective farmers will choose a job which gives them more utility, according to assumption (1). Accordingly, if $E(U)_{farming}$ is bigger than $E(U)_{non\text{-}farm\ job}$, the maximum $E(U)$ is $E(U)_{farming,}$ and these people will enter farming. But if $E(U)_{farming}$ is smaller than $E(U)_{non\text{-}farm\ job}$, the maximum $E(U)$ is $E(U)_{non\text{-}farm\ job,}$ and these people will get non-farm jobs.

5.3.1.3 Classification of types of prospective farmers

There are four possible types of prospective farmers, according to the expectations of job utility discussed above.

The first is a type which values the expected utility of farming above that of a non-farm job,

and this type is defined as a ‘farming preference type’ (FPT). This type can be further divided into two types. The one is a type which values the expected utility of farming above the expected utility of a non-farm job, due to the higher probability of getting a job in farming, and this type is defined as a ‘risk-averse farming preference type’ (RAFPT). The other is a type which values the expected utility of farming above that expected of a non-farm job, mainly due to expectations of a higher income, a better quality of life in a rural area, and better social standing, and this type is defined as a ‘farming preference type’ (FPT).

The second is a type which values the expected utility of a non-farm job above that of farming, and this type is defined as a ‘non-farm job preference type’ (NFPT). This type too is divided into two types. The one is a type which values the expected utility of a non-farm job above that of farming, due to expectations of a higher income, a better quality of life in an urban area, and better social standing, and this type is defined as a ‘non-farm-job preference type’ (NFPT). The other is a type which values the expected utility of a non-farm job above that of farming, due to the higher probability of getting a non-farm job, and this type is defined as a ‘risk-averse non-farm-job preference type’ (RANFPT). The above four types of prospective farmers are summarized in Table 5.4 below.

Table 5.4 Four types of prospective farmers

Classification	Main determinants of utility	
	Higher utility of job	Higher probability of getting job
Entry into farming $E(U)_{\text{farming}} > E(U)_{\text{non-farm job}}$	FPT	RAFPT
Entry into non-farm job $E(U)_{\text{farming}} < E(U)_{\text{non-farm job}}$	NFPT	RANFPT

(Source: Own table)

5.3.2 Old farmers

5.3.2.1 Assumptions

First, old farmers have tried to maximize the utility of their job throughout their working life.

Second, old farmers do not have other, non-farm, jobs.

Finally, old farmers have only two options: exiting farming or continuing farming. Therefore, if farmers decide to leave farming, they do not get another, alternative, job except small-scale farming as a leisure activity or in order to provide produce for their own consumption.

5.3.2.2 Utility function of old farmers

The utility function for old farmers consists of a choice between consumption and leisure, and the consumption is proxied by income from farming. So, the utility (U) function of old farmers can be represented as in equations (4) and (5) below.

$U = f(Leisure, consumption)$ ---------- *(4)*

$U = f(Leisure, Income_{Farming})$ ---------- *(5)*

The maximum utility for an old farmer is a choice between the utility of leisure and the utility of income $_{Farming,}$ because old farmers can choose only one of these, according to assumptions (2) and (3).

$Max(U) = Max[U(Leisure), U(Income_{Farming})]$ ---------- *(6)*

Therefore, if *U* (Leisure) is bigger than *U* (Income), max *(U*) is *U* (Leisure) and old farmers will quit farming. But if *U* (Leisure) is smaller than *U* (Income $_{Farming}$), max *(U)* is *U* (income $_{Farming}$) and old farmers will continue farming.

5.3.2.3 Classification of types of old farmers

Types of old farmer can be classified into the following four categories, according to the above utility functions.

The first is a type which values the utility of leisure above that of income from farming, and is defined as a ‘leisure preference type’ (LPT). This type can be further classified into two types according to the utility of farm income and that of leisure. The one is a type which values the utility of leisure above that of farming income, irrespective of farming receipts and farming costs. This type can be defined as a ‘leisure preference type’ (LPT). The other is a type that values the utility of leisure above that of farming income only when they cannot get the income they expected from farming, and this type can be defined as a ‘conditional leisure preference type’ (CLPT).

The second type values the utility of farming income above that of leisure, and this type is defined as a ‘farming preference type’ (FPT). This type too can be further classified into two types. The one is a type which values the utility of income over that of leisure only when they can get the income they expected, and this can be defined as an ‘income maximization type’ (IMT). The other type values the utility of income irrespective of expected receipts and farming costs, and this type can be defined as a ‘livelihood type’ (LHT). The four types of old farmers just described are summarized in Table 5.5 below.

Table 5.5 Four types of old farmers

Classification	Farming income < Expected income	Farming income > Expected income
Farming exit U (L) > U (I)	CLPT(IMT)	LPT
No farming exit U (L) < U (I)	LHT	IMT(CLPT)

(Source: Own table)

5.4 Summary and conclusions

This chapter discussed a typology of prospective farmers and old farmers as one of the personal characteristics that could affect farm entry and farm exit. Diverse models of farm entry and exit were reviewed (Section 5.2.2) and an appropriate model was selected by specifically considering farming in Korea (Section 5.2.3). The types of prospective farmers were defined from the expected utility maximization model and are summarized in Table 5.4, and the types of old farmers were defined from the utility maximization model and are seen in Table 5.5.

A typology of farmers is expected to contribute to the development of farm entry and exit studies by widening the scope of study as well as by finding a new factor which explains and predicts farm entry and farm exit more accurately. It could also contribute to improvements in the effect of agricultural structural adjustment policy on farm entry and exit, by showing how this could utilize the difference in likelihood of farm entry and exit between types.

CHAPTER 6

RESEARCH METHODOLOGY

6.1 Introduction

This research investigates why agricultural structural adjustment policy has not stopped the trend towards a decrease in the number of young farmers and an increase in the number of old farmers; and it puts forward the hypothesis that the low likelihoods of farm entry by prospective farmers and of farm exit by older farmers - as well as competitiveness policy, rural development policy, farming conditions, and farm entry and exit barriers - all restrict the effect of farm entry and exit policy.

Methods used to solve research questions or to verify hypotheses should be drawn from generally accepted or generally acceptable logical procedures if they are to be accepted as having scientific validity in the social sciences. It is believed that research methods and research methodologies provide logical and scientific paths towards answers to research questions. Therefore, the selection of a research method or a research methodology to answer research questions becomes the most crucial concern after the development of a research question.

The way in which research is conducted, that is the research methodology, can be illuminated by the research philosophy, research strategy, research method, and research instruments and techniques that are adopted; and so this chapter discusses these issues in detail, in order to investigate the hypothesis.

This chapter is developed as follows. Research paradigms and strategies are briefly introduced

(Section 6.2) and the research method is selected and justified (Section 6.4). Then the issues of research design, like measurement and scale, are discussed in detail (Section 6.5). Research methods – that is methods of data collection (Section 6.6) and data analysis (Section 6.7) – are explained in order, and the chapter is then summarized and concluded (Section 6.8).

6.2 Research paradigms and strategies

6.2.1 Overview

According to Neuman (2006: p.2), methodology refers to 'understanding the social organizational context, philosophical assumptions, ethical principles, and political issues of the enterprise of social researchers who use methods'. Accordingly, methodology means conceptualization of the social world which researchers encounter, and it provides a series of meanings which are given to the social world by research studies. According to this kind of definition, the conceptual scope of methodology is dependent on the scope of the research method chosen, and, therefore, the definition of methodology can be better understood by defining the research method, and vice versa. This has a thread of connection with the view that all methods have their own methodologies to support their validity.

A research method is defined as 'a set of specific techniques for selecting cases, gathering and refining data, analyzing the data, and reporting on results' (Neuman, 2006: p.2). Therefore, a research method can be presented as a formalized and comprehensive frame which is designed to elicit scientific knowledge. Meanwhile, the process of data collection is often identified with a research method (Cargan, 2007; Corbetta, 2003), due to the emphasis on the process of data collection among the features of research methods. For this reason, research methods are identified with questionnaires, observations, experiments, and case studies

(Corbetta, 2003).

From the definitions of the above concepts, it can be seen that methodology is a conceptual basis which supports a series of processes of research, especially the collection of data at specified intervals, the measurement of variables, sampling, methods of contacting subjects, and data analysis (O'Sullivan and Rassel, 1994). The reporting of research results and the limitations of these results are also comprehended in the scope of methods and methodology (Cargan, 2007). Despite the conceptual difference between method and methodology, the two are used together and are often taken to be similar to each other. But, a research method and a methodology are different concepts, and the latter comprehends the former (Neuman, 2006).

6.2.2 Research paradigms

What kinds of methods and methodologies are there? What are the fundamental points that differentiate these methodologies and methods from one another? To answer these questions, the concept of the paradigm needs to be elucidated.

> *"A paradigm may be viewed as a set of basic beliefs (or metaphysics) that deals with ultimates or first principles. It represents a worldview that defines, for its hold, the nature of the "world", the individual's place in it, and the range of possible relationships to that world and its parts, as, for example, cosmologies and theologies do. The beliefs are basic in the sense that they must be accepted simply on faith (however well argued); there is no way to establish their ultimate truthfulness." (Guba and Lincoln, 1994:p.107).*

According to Guba and Lincoln (1994), a paradigm is a belief system which is based on ontological, epistemological, and methodological assumptions. There are some basic

paradigms, like positivism, interpretivism, and critical theory, and these are based on different perspectives on the ontological, epistemological and methodological questions that social researchers have to answer (Corbetta, 2003). For example, positivists believe that the social world exists as a real one, and that it can be recognized objectively, so that it can be conceptualized and measured by experimental and manipulative observation methods. By contrast, interpretivists regard the social world as a subjective one which is constructed through the process of social interaction, and they argue that recognition of this world is relative, depending on an individual's way of seeing things and his or her interpretation of them (Sullivan, 2001). Therefore, they emphasize the ways of understanding the social world, rather than seeking to quantify it. Table 6.1 below summarizes the characteristics of each paradigm according to its ontological, epistemological, and methodological bases.

Table 6.1 Comparison of three paradigms of social studies

	Positivism	Interpretivism	Critical theory et al.
Ontology	Naïve realism: social reality is 'real' and knowable (as if it were a 'thing')	Constructivism: the knowable world is that of meanings attributed by individuals. Relativism (multiple realities): these constructed realities vary in form and content among individual groups, and cultures	Historical realism: virtual reality shaped by social, political, cultural, economic, ethnic, and gender values; crystallized over time
Epistemology	Dualism-objectivity The results Experimental science in search of laws	Non-dualism: non-objectivity. Researcher and object of study are not separate, but interdependent Interpretive science in search of meaning	Transactional/subjectivist; value mediated findings

	Goal: Explanation Generalizations: 'natural' immutable laws	Goal: comprehension Generalizations: opportunity structures; ideal types	
Method ology	Experimental: manipulative Observation Observer-observed detachment Mostly induction Quantitative techniques Analysis 'by variables'	Empathetic interaction between scholar and object studied Interpretation Observer-observed interaction Induction (knowledge emerges from the reality studied) Qualitative techniques Analysis 'by cases'	Dialogic/dialectical

(Source: Partially adapted from Guba and Lincoln (1994:109) and Corbetta (2003:14))

6.2.3 Research methods

Meanwhile, Table 6.2 below shows research methods and type of studies by paradigm. For example, from the perspective of positivists, the social world is seen as an objective one and, therefore, quantitative research methods like an experiment, a survey, or a questionnaire, can be used to explain, describe, and evaluate the social world. However, from the point view of interpretivists or constructionists, the social world is regarded as subjective and dependent on researchers, and, therefore, qualitative methods like participant observation, in-depth interview, and focus group can be used.

Table 6.2 Research methods by paradigms

	Positivism	Interpretivism	Critical theory
methods	Empirical structured and replicable observation Quantification/measurement Experimental – directly manipulate variables and	Unstructured observation Open interviewing Discourse analysis Try to capture 'insider' knowledge	Participatory action research Dialogical methods – which encourage dialogue between researcher and researched

	observe	
Types of studies	Survey studies Verification of hypotheses Statistical analysis Quantitative descriptive studies	Field research, conducted in natural settings, in order to collect substantial situational information

(Source: Partially adapted from Voce (2004:5))

6.3 Research question, hypotheses, and research objectives

6.3.1 The research question

A point of departure for a research study is a research question, and the significant items which are related to research questions are research subjects, analysis units, their characteristics, and the relationship between them (Singleton, 1993).

This research is mainly about an agricultural problem and the use of agricultural structural adjustment policy to cope with it. This research starts from the fact that a structural change, an increase in old farmers and a decrease in young ones, has continued even though the government established agricultural structural adjustment policy in the early 1990s to encourage young people to become engaged in farming and induce old farmers to retire from farming. Therefore, the following research question is set up.

Why does agricultural structural adjustment policy not stop the trend towards a decrease in young farmers and an increase in old farmers?

Under these circumstances, some researchers (Kim, 2007) argued that structural adjustment policy could be effective in solving the problem, due to the role of economic incentives. But others (Lee, 2007; Lim and Cho, 2004; Ahn et al., 2003) said it could not change the trend because farm exit barriers, such as income shortage or poor living circumstances, are more

influential in this phenomenon than economic incentives. But these researchers only estimated the relationship between the two indirectly, by working with the potential role of economic incentives rather than the real role. Although the controversy on the relationship between agricultural structural adjustment policy and farm entry and farm exit has continued, theoretical and empirical research studies on the relationship between the two are scarcely to be found.

6.3.2 The hypotheses

So, why does agricultural structural adjustment policy not stop the trend towards a decrease in young farmers and an increase of old ones, despite the fact that government interventions such as financial incentives are expected to facilitate farm entry and exit (Kim, 2007).

6.3.2.1 Farm entry

Why does agricultural structural adjustment policy not stop the trend towards a decrease in young farmers?

I argue that the low probability of farm entry by rural-born young prospective farmers, incompatibility between farm entry policy, competitiveness policy and rural development policy, farming conditions, and farm entry barriers hinder farm entry, in spite of agricultural structural adjustment policy.

First, I argue that prospective farmers who are born in rural areas do not have a higher probability of farm entry than others, and, therefore, agricultural structural adjustment policy, which is intended to make rural-born young people stay in farming, does not prevent them from leaving farming. To investigate this argument, null hypothesis H_{01} and alternative

hypothesis H_{A1} were formalized as follows.

H_{01}: Rural-born prospective farmers are more likely to take up farming than urban-born people.

H_{A1}: Rural-born prospective farmers are not more likely to take up farming than urban-born people

Second, I argue that farm entry policy does not contribute to farm entry; rather, competitiveness policy or rural development policy cancels the effect of farm entry policy, due to mutual incompatibility between them. For example, although competitiveness policy promotes farm entry by making young people feel more positive about a farming job, rural development policy could have a negative effect by creating other, non-farm job opportunities in rural areas. To investigate this argument, null hypothesis H_{02} and alternative hypothesis H_{A2} were formalized as follows.

H_{02}: Farm entry policy contributes to farm entry, and competitiveness policy and rural development policy do not cancel out the effect of farm entry policy.

H_{A2}: Either farm entry policy does not contribute to farm entry, or competitiveness policy or rural development policy cancel out the effect farm entry policy.

Third, I argue that farming conditions hinder prospective farmers' farm entry. According to previous studies by Kimhi (1994), Todaro (1969), and Kang (2004), farming conditions like farming income and living conditions in rural areas affect farm entry. For example, if farming income and living conditions in rural areas are inferior to those in non-farm jobs and urban areas, the effect of farm entry policy could be limited. To investigate this argument, null hypothesis H_{03} and alternative hypothesis H_{A3} were formalized as follows.

H_{03}: Farming conditions are not the cause of low likelihood of farm entry.

H_{A3}: Farming conditions are the cause of low likelihood of farm entry.

Fourth, I argue that farm entry barriers hinder prospective farmers' farm entry because they prevent young people from becoming engaged in farming (Gale, 2003). To investigate this argument, null hypothesis H_{04} and alternative hypothesis H_{A4} were formalized as follows.

H_{04}: Farm entry barriers are not the cause of low likelihood of farm entry.

H_{A4}: Farm entry barriers are the cause of low likelihood of farm entry.

Finally, I argue that even if farming conditions or farm entry barriers do not hinder farm entry, they cancel the effect of farm entry policy. To investigate this argument, null hypothesis H_{05} and alternative hypothesis H_{A5} were formalized as follows.

H_{05}: Farming conditions and farm entry barriers do not cancel out the effect of farm entry policy.

H_{A5}: Farming conditions or farm entry barriers cancel out the effect of farm entry policy.

6.3.2.2 Farm exit

Why does agricultural structural adjustment policy not stop the trend towards an increase in old farmers?

As in the case of farm entry, I argue that the low probability of farm exit by old farmers, incompatibility between farm exit policy, competitiveness policy, and rural development policy, farming conditions, and farm exit barriers all hinder the farm exit of old farmers, despite the existence of agricultural structural adjustment policy.

First, I argue that older famers are not more likely to exit farming than younger farmers and, therefore, agricultural structural adjustment policy, which is intended to induce old people to

exit farming, does not work. On the basis of the relationship between age and farm exit, some researches have argued that farm exit could be facilitated by lowering the upper age limit at which farmers can apply for the early farm exit program, because farmers are less likely to exit from farming as they get older (Väre, 2006; Pietola et al., 2003). To investigate this argument, null hypothesis H_{01} and alternative hypothesis H_{A1} were formalized as follows.

H_{01}: Older farmers are more likely to exit from farming.

H_{A1}: Older farmers are not more likely to exit from farming.

Second, I argue that farm exit policy does not contribute to farm exit, or that mutual incompatibility between farm exit policy, competitiveness policy and rural development policy cancel the effect of farm exit policy. For example, competitiveness policy, which aims to increase the profitability of farming by farmland consolidation and improvement of farming infrastructure, could induce old farmers to stay farming. Rural development policy too could make old farmers stay farming by giving them another income source through the facilitation of non-farm jobs. To investigate this argument, null hypothesis H_{02} and alternative hypothesis H_{A2} were formalized as follows.

H_{02}: Farm exit policy contributes to farm exit, and competitiveness policy and rural development policy do not cancel out the effect of farm exit policy.

H_{A2}: Farm exit policy does not contribute to farm exit, or competitiveness policy or rural development policy cancels out the effect of farm exit policy.

Third, I argue that farming conditions hinder farm exit. If old farmers can get an income from farming and a government subsidy as long as they farm, they can use these sources of income to delay their farm exit (Kang, 2007). To investigate this argument, null hypothesis H_{03} and alternative hypothesis H_{A3} were formalized as follows.

H_{03}: Farming conditions are not the cause of low likelihood of farm exit.

H_{A3}: Farming conditions are the cause of low likelihood of farm exit.

Fourth, I argue that farm exit barriers hinder farm exit. Old farmers have to continue farming, even though they want to exit, if they cannot overcome farm exit barriers like an absence of successors (Kang, 2004). To investigate this argument, null hypothesis H_{04} and alternative hypothesis H_{A4} were formalized as follows.

H_{04}: Farm exit barriers are not the cause of low likelihood of farm exit.

H_{A4}: Farm exit barriers are the cause of low likelihood of farm exit.

Finally, I argue that even though farming conditions or farm exit barriers do not hinder farm exit, one of or more of them cancels the effect of farm exit policy. To investigate this argument, null hypothesis H_{05} and alternative hypothesis H_{A5} were formalized as follows.

H_{05}: Farming conditions and farm exit barriers do not cancel out the effect of farm exit policy.

H_{A5}: Farming conditions or farm exit barriers cancel out the effect of farm exit policy.

6.3.3 The research objectives

The objectives of this research are as follows. First, it aims to explain the effect of agricultural structural adjustment policy on the farm entry of prospective farmers and farm exit of old farmers. In addition to this, it also explains the offset between farm entry and farm exit policy, competitiveness policy, and rural development policy, as well as the offset between farm entry and exit policy, farming conditions, and farm entry and exit barriers. Second, it aims to test theories on farm entry and farm exit which have been argued in previous research studies. And we shall also assess whether theories developed about other countries can be applied to

the case of Korea. Finally, this research aims to evaluate the effectiveness of agricultural structural adjustment policy with regard to farm entry and exit in Korea. It is thought that this will be helpful in establishing a more effective structural adjustment policy, and that it will also help with predicting the tendency of farm entry and farm exit as a result of agricultural structural adjustment policy.

6.4 The research method of this research and its justification

6.4.1 Two strategies of the research

A research method has been defined as a procedure to be adopted to solve research problems (Chadwick et al., 1984). There are two kinds of basic approaches to solving research problems, and these are a quantitative approach and a qualitative approach. A quantitative approach and a qualitative approach are designed to get different kinds of data. A quantitative approach to research aims to obtain quantified data like numbers that will present a picture; but qualitative research seeks to obtain non-quantitative data which will present a picture using words, sentences, and symbols.

As can be estimated from the data which they produce, these two approaches are based on different paradigms. A quantitative approach is based on the theory of positivism, but a qualitative approach is based on the paradigm of interpretivism or critical theory (Neuman, 2006). Table 6.3 compares the two approaches in terms of their epistemological and ontological foundations, and relevant kinds of research methods are listed in it. For example, a quantitative approach is based on objectivism and positivism, and experiment and a survey belong to a quantitative research approach.

Table 6.3 Fundamental differences between a quantitative and a qualitative strategy

	Quantitative	Qualitative
Epistemological orientation	Natural science model, positivism	Interpretivism
Ontological orientation	Objectivism	Constructionism
Kinds of research method	Experiment, survey	Field research, participant observation and ethnography, unobtrusive observation, in-depth interview, case studies, focus groups (Sullivan, 2006)

(Source: Partially adapted from Bryman (2001:20))

A quantitative approach and a qualitative approach are applied to research problems and goals which have different scopes (Maxwell and Loomis, 2002). But, the differences between a quantitative approach and a qualitative approach are not distinct, and many researchers combine both approaches (Sullivan, 2001), because neither of the two approaches alone can be thought as a perfect technique for social studies (Hakim, 2000).

6.4.2 The criteria for selecting a research method

What kind of a research method is appropriate to this research? Generally, the selection of a research method is influenced by the characteristics of the research and those of the researcher. That is, a research method is dependent on the recognition of the social world and the degree of knowledge about their research topic of researchers (Morris, 2007; Sullivan, 2001). Positivists adopt a quantitative approach and, therefore, an experiment and a survey may be used. But interpretivists adopt a qualitative approach and, therefore, a focus group and a case study may be used. When researchers have little knowledge about a social phenomenon, a qualitative approach is more appropriate than a quantitative approach.

A research method is also determined by the characteristics of the research which is being

undertaken. This means that inquiry types, research goals – such as explanation, description or exploration – and types of data, – structured or unstructured – and number of subjects (Cargan, 2007) affect the selection of a research method. For example, a quantitative research method is appropriate for providing a description or an explanation, but qualitative research is appropriate for exploration. And the selection of a research method is also influenced by time and budget.

6.4.3 Justification of the research method

6.4.3.1 Research methods of previous studies and their limitations

Previous studies in this area were mainly based on positivism, which tries to conceptualize and objectively measure social reality. For this reason, most of them adopted a quantitative approach (Section 2.3).

As was seen in Section 2.3, the majority of studies which have aimed at elucidating the relationship between the personal characteristics of farmers and farm entry and exit have used secondary analysis (Cargan, 2007) or a farm survey, which has meant collecting available data from the national statistical agency or using a survey method. These studies apply multivariate statistical procedures like regression models or logit or tobit or probit models to compare the relationships and draw conclusions from them.

A secondary analysis or a correlation of research is weak when it comes to explaining the relationship between two variables because of the possibility that a third variable can intervene in the relationship (Dooley, 2001). This means that additional variables which might affect farm entry and exit, like agricultural structural adjustment policy, cannot be included in the model. Therefore, a more sophisticated research method should be chosen for this kind of

study.

6.4.3.2 The research method of this research

A survey

> *"Survey researchers sample many respondents who answer the same questions, measure many variables, test multiple hypotheses, and infer temporal order from questions about past behavior, experiences, or characteristics." (Neuman, 2006: 276).*

What is a survey? A survey is defined as a questioning technique for representative subjects in which formalized procedures are used to elucidate the relationship between variables (Corbetta, 2003), and it was originally devised to grasp phenomena which occur in the social world (Crano and Brewer, 2002). Specifically, the attitudes, behavior, and demographics of people become primary objects of investigation, and data are obtained by asking the same questions of many subjects using questionnaires. Therefore, the characteristic activities associated with a survey are designing questionnaires and administering them (Bordens and Abbott, 1991). Meanwhile, a survey is often identified with correlation (Neuman, 2006), because it aims to investigate the relationship between variables.

A survey research method is classified into sub-types by the techniques used for contacting subjects and the kinds of instruments used. Two common types of survey with different techniques for contacting subjects are a self-administered questionnaire and an interview (Cargan, 2007). An interview is a conversation between two people, and a questionnaire can be defined as a self-interview (Chadwick et al., 1984). Surveys can be also classified into in-person surveys, mail surveys, telephone surveys, and internet surveys. A survey can be also be

classified as a structured survey or an unstructured survey, according to the instruments used. A structured survey has structured questions and answers, which means it belongs with quantitative research. But an unstructured survey belongs with qualitative research methods (Corbetta, 2003).

Due to these kinds of characteristics, a survey has many advantages compared with other quantitative methods, like experiments. First, a survey can get data from larger samples than other methods, and the data which are obtained from samples can be generalized to a population (Sullivan, 2001). Second, a survey is an easier and simpler technique for obtaining data from respondents, with a lower cost in money and time (Chadwick et al., 1984). Third, a survey research method is useful for obtaining information about the attitudes or beliefs of subjects and data on past events. Finally, a survey can be used for explanatory research as well as for research leading to description, exploration, and evaluation (Sullivan, 2001). But survey methods cannot get deeper information on subjects in the way that participatory observation can. And it is inferior to experiment in explaining causation.

So, why is a survey appropriate for this type of research? As is seen above, a research method is mainly affected by paradigms, inquiry types, and the kinds of data which are required to solve research questions. This research aims to explain the relationship between variables – that is the relationship of the personal characteristics of farmers, agricultural structural adjustment policy, and farm entry and exit. It also tries to generalize the results to the population of Korea as a whole. Therefore, numerical data which accurately represent the attributes of research subjects, as well as making it possible to draw concise conclusions by comparisons among farmers, are needed to elucidate this relationship. And these kinds of data can be obtained effectively by a survey. In addition, attitudes to agricultural structural

adjustment policy cannot easily be measured in a laboratory or a field experiment, even though an experiment is superior to a survey when inferring causality (Sullivan, 2001). Further, other quantitative methods are unavailable when the relationship being verified involves three variables.

An open-ended qualitative interview

> *"Occasionally, single methods will be bolstered with the simultaneous use of focus groups or an observational component or, sequentially, with an instrument developed, for instance, from interview data." (Morse, 2003:p.189).*

Although this research is basically based on a survey, a qualitative research method, open-ended interviews were also conducted to obtain data which could not be obtained using quantitative techniques. Although this way of proceeding can be called a mixed method, it is more reasonable to call it a single method (Morse, 2003) because the main research problem is verified by quantitative analysis.

Quantitative data is essential to explain the relationships between personal characteristics and farm entry and exit, but qualitative data can complement the quantitative data in that it helps us understand how those kinds of relationship have developed, as well as why there is a difference between personal characteristics. Therefore, a combination of research methods can be superior one to single research method (Johnson and Onwuegbuzie, 2004), although there can be different ways of combining them (Johnson and Christensen, 2007).

When adopting quantitative methods as primary research methods, qualitative methods like in-depth interviews and focus group interviews can be an appropriate approach for complementing quantitative research, because interviews are a helpful way of investigating

additional responses when combined with questionnaire surveys (McNamara, 1999).

The qualitative interview method is a powerful tool in helping the researcher understand the social, cultural, and historical context of phenomena, because both meaning and factual evidence can be obtained from it (Kvale and Brinkmann, 2008). And in this case, the factual findings helped contextualize the quantitative ones (Patton, 2002). Therefore, qualitative interviews can be used as a secondary source of data to supplement quantitative methods, rather than as a primary source of evidence, for this kind of study.

This research adopted standardized and open-ended interviews (Patton, 2002) as a supplement to the survey research method, rather than focus group or in-depth interviews. This was because the research did not aim to get its information mainly by interpreting qualitative evidence, but to use such interpretation to supplement the evidence of relationships between variables which emerged from quantitative analysis. For this purpose, standardized and open-ended interviews are an effective means of proceeding.

6.5 The research design

6.5.1 Overview

Research studies start from research questions, and the collection of data to answer the questions forms the main body of a research study. Therefore, a plan to collect data becomes significant, and research design provides a scientific process to collect data.

The design of a piece of research represents the researcher's decision on 'when and how often to collect data, what data to gather, from whom and how to collect data, and how to analyze data' (O'Sullivan and Rassel, 1994: p.21). Therefore, the design is a plan for data collection

and analysis (Corbetta, 2003) and it may also be called the presentation of a plan for research methodology (O'Sullivan and Rassel, 1994). In a broad sense, research design includes all the issues involved in carrying out a research plan and bringing it to a conclusion. The significance of research design can be found in the fact that the quality of a piece of research is determined by the design of that research as a planned procedure to obtain scientific knowledge (Chadwick et al., 1984). The design of a piece of research shows the procedures that will be needed to produce data and the ways in which these procedures guarantee the validity of the data (Cargan, 2006).

The design of a research study includes research strategy elements like a quantitative or a qualitative approach, a conceptual framework, research subjects, and methods for data collection and analysis (Punch, 2005). Specifically, an analysis unit, sampling methods, instruments, and data analysis methods are the main parts of research design (Chadwick et al., 1984; Punch, 2005) and, of these, the main concerns in the process of research design are sampling and measurement (Newman, 2006).

6.5.2 Conceptual framework

A conceptual framework presents variables, and relationships among them, using graphic or narrative techniques (Miles and Huberman, 1994). This contributes to the clarification of research goals, the development of research questions, the choice of research methods, and the justification of research studies (Maxwell, 2005). In the following sections, the conceptual framework for this research will be explained in terms of the subjects of the research, that is as it relates to prospective farmers and old farmers.

6.5.2.1 Farm entry

Theoretical basis

As was seen in Chapter 2, there have been many research studies which have analyzed the effect of the demographic and socio-economic characteristics of prospective and old farmers on farm entry and exit, which is partly because the characteristics of prospective and old farmers, like age, are important concerns when designing agricultural structural adjustment policy. However, these pieces of research did not verify how agricultural structural adjustment policy affected farm entry and exit. This research uses a theory about the relationship between attitude and behavior to elucidate the role of agricultural structural adjustment policy in farm entry and exit.

According to (Ajzen, 1989:241), "An attitude is an individual's disposition to respond favorably or unfavorably to an object, person, institution, or event, or to any other discriminable aspect of the individual's world". Attitude is formed through complicated processes and diverse components (Olson and Kendrick, 2008), and it can be evaluated from responses that are cognitive, i.e. exhibit thoughts and beliefs about objects or people; affective, i.e. exhibit feelings about objects or people; or conational, i.e. exhibit a tendency or disposition to act in certain ways toward objects or people.

Attitude became an important concept because it was believed that it could explain social behavior (Greenwald, 1989), but there have been conflicting arguments on the direct relationship between attitude and behavior. Therefore, many researchers have tried to increase the predictability of attitude by proving the consistency between attitude and behavior, which can be classified into three categories, although it is difficult to draw a clear line between

them. The first category denies any direct association between attitude and behavior and adopts other intervening and antecedent factors which affect the relationship between attitude and behavior. Ijzen and Fishbein (1980) explained that attitude to objects and subjective norms affects behavioral intention, and behavioral intention comes to affect behavior. And Ijzen (1989, 1991), extending the previous theory, adopted the concept of perceived behavioral control, and argued that this also affects behavioral intention. Another theory tries to find the cause of inconsistency without denying direct association between attitude and behavior. For example, it is argued that there is a non-linear relationship between attitude and behavior, and therefore the relationship between attitude and behavior can differ when characteristics differ (Doorn et al., 2007; Holland et al., 2002; Patterson and Duttton, 1975). The last category not only denies direct association between attitude and behavior but also accepts the effect of antecedents like people's characteristics on attitude (Li and Zhang, 2002).

In spite of the arguments above, the direct relationship between attitude and behavior still seems to be strongly supported. Although "the predictive validity of global attitudes[2] tends to be relatively low" (Ajzen and Cote, 2008: 296), "We can expect a strong attitude-behavior correlation only to the extent that the measures of attitude and behavior involve exactly the same action, target, context, and time elements" (Ajzen and Cote, 2008: 299). Research studies on the effect of accessibility of memory on attitude (Fazio et al., 1982) or conformity between attitude and behavior (Shavitt and Fazio, 1991; Ajzen and Fishbein, 1977) could belong to this category. Like above, the principle of compatibility (Ajzen and Fishbein, 1980; Ajzen and Cote, 2008) provides a robust theoretical basis for attitude behavior relation.

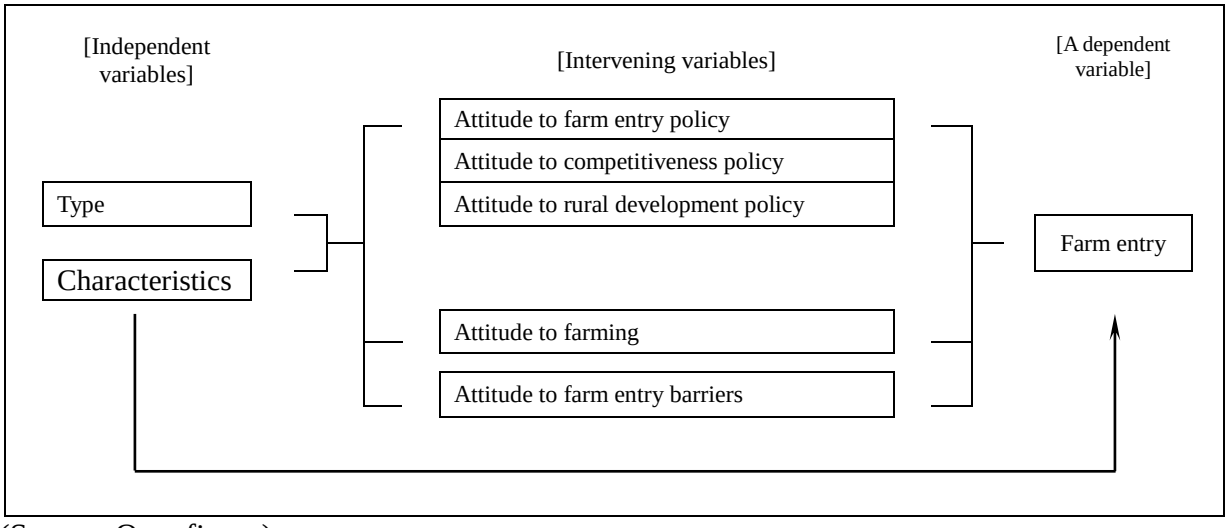
[2] "A global attitude is an evaluation of a target that involves no specific actions, context, or time elements. A scale that assesses attitudes toward Muslims, for example, results in a score that represents a generally favorable or unfavorable evaluation of Muslims: no particular action, context, or time is specified."(Ajzen and Cote, 2008: p.299)

On the basis of the relationship between personal characteristics and farm entry and exit (Chapter 2) and the principle of compatibility, this research theorizes that the personal characteristics of farmers affect attitudes to farming, attitudes to agricultural structural adjustment policy, and attitudes to farm entry and exit barriers, and that those attitudes also affect farm entry and exit. In doing so, it suggests how farming, agricultural structural adjustment policy, and farm entry barriers affect farm entry of prospective farmers and why agricultural structural adjustment policy is not effective.

Kinds of variables and their relationships

Figure 6.1 represents the kinds of variables involved in farm entry and the relationships between them. Independent variables are prospective farmers' type and their demographic and socio-economic characteristics, such as age and schooling received; the intervening variables are attitude to agricultural structural adjustment policy, attitude to farming, and attitude to farm entry barriers; and the dependent variable is farm entry.

Figure 6.1 Conceptual framework of farm entry



(Source: Own figure)

The above framework is different from ones used in previous studies which only investigated the relationship between the characteristics of a prospective farmer and farm entry, whereas this research adopts intervening variables. Previous studies did not adopt intervening variables, which seems to be due to the fact that they used secondary analysis based on available data.

From the above conceptual framework[3], it is expected that the type and characteristics of a prospective farmer affect farm entry directly or indirectly, according to the effect of agricultural structural adjustment policy, farming, and farm entry barriers.

Expected results

First, the type and characteristics of prospective farmers are expected to affect farm entry. For example, it can be estimated that a prospective farmer who belongs to a type that has a preference for farming is more likely to undertake farming than one who belongs to a type that has a preference for a non-farm job. And the location of farmland is also expected to affect farm entry, because rural areas may not be preferred to urban areas. But what has been studied in school, the number of family members, sex, birth place, and whether a person has had farming experience or not (Kim and Ma, 2005) are not expected to affect farm entry.

Second, it is estimated that the type and characteristics of a prospective farmer indirectly affect farm entry through attitude to farm entry policy, attitude to competitiveness policy, and attitude to rural development policy. This is because agricultural policy affects decision-making by farmers (Grant, 2006), as well as attitudes to farming such as degree of interest in farming, which are associated with farming income, the social status of farmers, and rural life

[3] Specification errors in causal order or causal direction can be detected by prior research, theory, and qualitative method to support potential mediation among variables although those are not testable (Mackinnon, 2009).

(Kang, 2004). It is thought that farm entry policy and competitiveness policy mediate the relationship between the personal characteristics of prospective farmers and farm entry, due to economic incentives for these farmers. But rural development policy is likely to make prospective farmers get a non-farm job instead of farming.

Third, it is likely that that the type and characteristics of prospective farmers indirectly affect farm entry through attitudes to farming. It has been shown that the economic difference between a farming and a non-farm job is one of the causes of farm exit (Ranis and Fei, 1961; Jorgensen, 1961; Todaro, 1969). Therefore, prospective farmers who have more positive attitudes to farming, like the farming preference type for example, and to farming income and rural life, are more likely to do farming than others.

Fourth, it is expected that the type and characteristics of prospective farmers could affect farm entry indirectly through attitude to farm entry barriers. High set-up expenses and poor accessibility to financial services are examples of farm entry barriers, and these affect farm entry (Gale, 2003). Therefore, it is thought that prospective farmers who have a less negative attitude to farm entry barriers are more likely to enter farming than others.

Finally, even though the various attitudes to farming or attitudes to farm entry barriers do not mediate between the type and characteristics of prospective farmers and farm entry itself, attitudes to farming and attitudes to farm entry barriers could offset the effect of farm entry policy on farm entry, for the reasons described above.

6.5.2.2 Farm exit

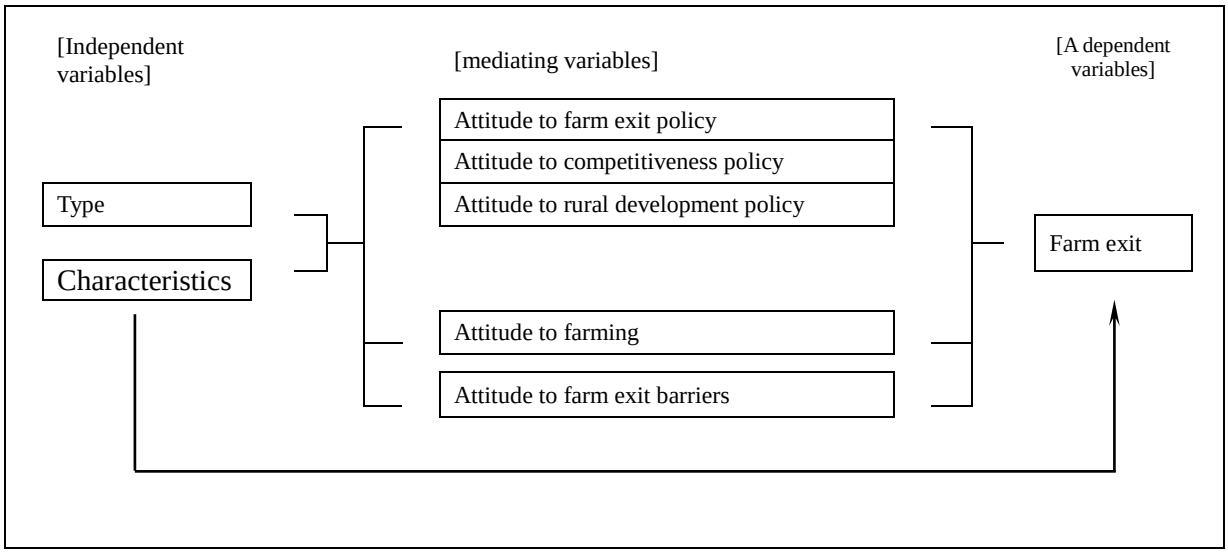
As was the case with farm entry in Section 6.5.2.1, ideas about the farm exit of old farmers can be based on the theory of relationship between attitude and behavior. Accordingly,

personal characteristics of old farmers affect attitudes to farming, attitudes to agricultural structural adjustment policy, and attitudes to farm exit barriers, which in turn will affect farm exit. This provides an explanation as to how farming conditions, agricultural structural adjustment policy, and farm exit barriers affect farm exit and why agricultural structural adjustment policy is not effective.

Kinds of variables and their relationships

Figure 6.2 shows the kinds of variables involved in farm exit and relationships among them. Independent variables are the type and characteristics of old farmers, like age; intervening variables are attitude to agricultural structural adjustment policy, attitude to farming, and attitude to farm exit barriers; and the dependent variable is farm exit.

Figure 6.2 Conceptual framework of farm exit



(Source: Own figure)

This framework is different from ones used in previous studies, in that this research adopts intervening variables like attitudes to farming, attitudes to agricultural structural adjustment policy, and attitudes to farm exit barriers. It seems that previous studies did not adopt

intermediary variables because they used secondary analysis.

From the above conceptual framework, it is expected that the type and characteristics of old farmers directly affect farm exit or indirectly affect it through attitudes to agricultural structural adjustment policy, attitudes to farming, and attitudes to farm exit barriers.

Expected results

First, the type and characteristics of old farmers are expected to affect farm exit directly. For example, old farmers who belong to a type that has a preference for leisure are more likely to exit from farming than those who belong to a type that seeks income maximization. And it is also to be expected that old farmers whose age is greater (Kimhi and Nachlieli, 2000), whose off-farm income is greater (Goetz and Debertin, 2001), who have non-farm jobs, who have more years of schooling, who have more children (Stiglbauer and weiss, 2000), who are helped by their children, or whose farmland is located in a more populated area (Rossier and Weiss, 2006) are more likely to exit from farming than others. But old farmers who have had a longer farming career (Kimhi, 1994), or who have more farming income, are less likely to exit from farming, which can be explained by the opportunity cost of farming.

Second, the type and characteristics of old farmers could affect farm exit indirectly through attitudes to agricultural structural adjustment policy. That is, attitudes to agricultural structural adjustment policy are expected to mediate the relationship between personal characteristics and farm exit, because farmers' decision-making is affected by agricultural policy (Grant, 2006). But the effect of attitudes to farm exit policy, attitudes to competitiveness policy, and attitudes to rural development policy on the relationship could be inconsistent. Although farm exit policy is expected to induce old farmers to exit farming, due to economic incentives,

attitudes to competitiveness policy and rural development policy could prevent them from exiting farming by increasing the profitability of farming or creating non-farm job opportunities. In this case, the effect of agricultural adjustment policy can be reduced due to a trade-off among those policies.

Third, it is expected that the type and characteristics of old farmers could affect farm exit indirectly, through attitudes to farming. According to earlier studies, attitudes to farming, like whether someone has a preference for farming or not, affect their decision about farming (Guither, 1963; Ganpat and Bholasingh, 1999; Willock et al., 1999). Therefore, it can be estimated that farmers who like farming are more likely not to retire from farming than those who do not like farming.

Fourth, it is expected that the type and characteristics of old farmers could affect farm exit indirectly through attitudes to farm exit barriers. It is possible that old farmers cannot help continuing farming if they cannot find successors to support them, or their income after retirement is not sufficient, even if they want to retire from farming. So, old farmers who come up against farm exit barriers are less likely to exit from farming than those who are not affected by any farm exit barriers.

Finally, even though neither attitudes to farming nor attitudes to farm exit barriers mediate between the type and characteristics of old farmers and farm exit, attitudes to farming and attitudes to farm exit barriers could offset the effect of farm exit policy on farm exit, for the reasons given above.

6.5.3 Measurement

6.5.3.1 Conceptual and operational definitions

Measurement is a process of allotting numerals to the values of variables (O'Sullivan and Rassel, 1994) and this process includes conceptualization, selection of variables and indicators, and operationalization (Singleton, 1993). Conceptualization is used to clarify complex and abstract concepts in research questions or hypotheses (Singleton, 1993) and to elucidate the meaning of them (O'Sullivan and Rassel, 1994).

Concepts as abstract expressions of ideas are changed into variables by operational definition (O'Sullivan and Rassel, 1994), and concepts are represented more concretely by this step. Operational definition or operationalization refers to the ways of measuring concepts (O'Sullivan and Rassel, 1994) by identifying variables and indicators. Operational definition is also represented as a kind of rule by which research subjects are allotted to categories of variables (Singleton, 1993).

6.5.3.2 Farm entry

The independent variables

In Table 6.4, the independent variables shown are the type and characteristics of prospective farmers, like their sex and the number of years of schooling they have had.

The first independent variable is the type of prospective farmers, and the type is determined by the difference in income between a farming and a non-farm job, the probability of getting a farming job as against getting a non-farm job, the difference in living conditions between rural areas and urban areas, and the social standing of a farming job as compared with that of a non-farm job (Section 5.3.1). Prospective farmers were categorized into the following types:

those who had a preference for farming; those who were risk-averse and preferred farming; those who were risk-averse and preferred a non-farm job; and those who had a preference for a non-farm job. Both the risk-averse type with a preference for farming and the risk-averse type who preferred a non-farm job were put in the risk-averse category. The definition of each type is as follows.

Table 6.4 Definition of types of prospective farmer

Category	Definition
FARMING PREFERENCE TYPE	***Where prospective farmers have the following attitudes.*** First, I prefer farming to a non-farm job and, Second, I am not affected by factors such as the likelihood of getting a job, but rather by factors such as the income gap between farming and a non-farm job, or the gap in social standing between the two types of job, or the gap in living conditions between rural areas and urban areas and, Finally, farming is the only job that I will get.
RISK-AVERSE TYPE	***Where prospective farmers have the following attitudes.*** First, I have no preference between farming and a non-farm job and, Second, my decision on job selection is more affected by factors such as the likelihood of getting a job than by factors such as the income gap between farming and a non-farm job, the gap in social standing between the two types of job, and the gap in living conditions between rural areas and urban areas and, Finally, I will select a job which gives me greater utility.
NON-FARM JOB PREFERENCE TYPE	***Where prospective farmers have the following attitudes.*** First, I prefer a non-farm job to farming and, Second, I am not affected by factors such as the likelihood of getting a job, but by factors such as the income gap between farming and a non-farm job, the gap in social standing between the two types of job, and the gap in living conditions between rural areas and urban areas. Finally, a non-farm job is the only job that I will get.

The other independent variables are the demographic and socio-economic characteristics of prospective farmers. The detailed definitions of these are shown in Table 6.5 below.

Table 6.5 Definitions of independent variables of farm entry

Variables	Definition
Grade	Grade of schooling prospective farmers belong to: indicated by '1st, 2nd, or 3rd year in agricultural high school', or 'agricultural college'
Major	Kind of farming subjects which prospective farmers major in at agricultural school: indicated by listing of crops such as vegetables, fruit and flowers, animal breeding, or other types
Position in family	Where prospective farmers come in their family: indicated by 'oldest child', or 'not the oldest child'
Sex	Indicated by 'male' or 'female'
Birth place	Birth place on the certificate of civil registration: indicated by city or county
Farming experience	Whether or not prospective farmers have helped their parents or been employed on farmland as an employee: indicated by 'experienced', or 'not experienced'.
Size of family	Whether prospective farmers have brothers and sisters: indicated by number of people
Parents' job	Job which provides parents with most of their income: indicated by 'farming' or 'non-farm job'
Farming produce	Kinds of farming produce which their parents cultivate or breed commercially: indicated by listing of crops, vegetables, fruit, flowers, animal breeding, and other types
Location of parents' farming activities	Location of farmland where prospective farmers' parents work: indicated by city or county

The intermediary variables

Intermediary variables are: attitude to agricultural structural adjustment policy (farm entry policy, competitiveness policy, and rural development policy); attitude to farming; and attitude to farm entry barriers. Definitions of these are presented in Table 6.6.

Table 6.6 Definitions of intermediary variables

Variables	Definitions
Attitude to farm entry policy	Response of prospective farmers to farm entry policy as encouragement towards farm entry. Measured by the degree to which farm entry policy positively encourages prospective farmers to undertake farming.
Attitude to competitiveness policy	Response of prospective farmers to competitiveness policy as encouragement towards farm entry. Measured by the degree to which competitiveness policy positively encourages prospective farmers to undertake farming.
Attitude to rural development policy	Response of prospective farmers to rural development policy as encouragement towards farm entry. Measured by the degree to which rural development policy encourages prospective farmers to undertake farming.
Attitude to farming	Attractiveness of farming to prospective farmers as a prospective job. Measured by the degree to which prospective farmers find the job attractive.
Attitude to farm entry barriers	Response of prospective farmers to farm entry barriers. Measured by the degree to which the various items appear as barriers to prospective farmers.

The dependent variable

The dependent variable is farm entry after graduation. Farm entry means that a prospective farmer starts farming as a commercial and independent farmer, regardless of farm size and farm products, shortly after finishing school. The dependent variable is measured by whether or not farm entry takes place after graduation, as well as the degree of intention to enter farming which prospective farmers consider themselves to have.

6.5.3.3 Farm exit

The independent variables

The first independent variable is the type of old farmers. These farmers were classified into four categories, which were determined by whether their preferences tended more towards farming or towards leisure: those who had a preference for unconditional leisure; those who had a preference for maximizing their income; those who had a preference for conditional leisure; and those who were most interested in their livelihood (see Section 5.3.2). Here, the four types were reclassified into three categories by combining the conditional leisure preference type and the income maximization type into one income maximization type. The definition of each type is shown in Table 6.7.

Table 6.7 Definition of types of old farmers

Category	Definition
LEISURE PREFERENCE TYPE	***Where old farmers have the following attitudes*.** First, I would prefer to exit farming rather than to continue farming Second, expected farm income size is not a significant factor for me in any decision about farm exit. Finally, I want to exit farming.

INCOME MAXIMIZATION TYPE	***Where old farmers have the following attitudes*** First, I have no preference between farming and exiting farming. Second, expected farm income size affects significantly my decision on whether or not to exit farming. Finally, I want to farm as long as I can get a satisfactory income from farming, but I will exit farming if the size of my income is smaller than I expected.
LIVELIHOOD TYPE:	***Where old farmers have the following attitudes*.** First, I prefer farming to exiting farming Second, I cannot live without my farm income and, therefore, I have no choice but to continue farming. Third, I will continue farming regardless of expected farm income size.

The other independent variables are the demographic and socio-economic characteristics of old farmers. These are defined in Table 6.8.

Table 6.8 Definitions of independent variables of farm exit

Variables	Definition
Age	Age is calculated by the birth date on the certificate of civil registration; indicated by ‘years’
Education	Amount of schooling received: indicated by ‘no schooling’, ‘elementary school’, ‘middle school’, ‘high school’, ‘undergraduate’, and ‘graduate’.
Sex	Indicated by ‘male’ or ‘female’
Farming career	Period during which old farmers have been engaged in farming as independent and commercial farmers: indicated by ‘years’
Farming income	Annual average farming income during previous 3 years, which is calculated by deducting farming expenses from gross farming revenue and indicated in KRW.
Number of non-farm jobs	Number of jobs which old farmers are engaged in, irrespective of working period and size of income: indicated by ‘none’ and ‘1 or more’

Off-farm income	Sum of income which is transferred by children working elsewhere or is earned from one or more non-farm jobs: Indicated in KRW.
Number of children	Number of sons and daughters, irrespective of marital status: indicated by 'people'
Birth place	Birth place on the certificate of civil registration: indicated by city or county
Participation of children	Whether old farmers are helped by one or more sons: indicated by 'help' or 'no help'.
Farming produce	Amount of farm produce which old farmers cultivate or breed commercially: indicated by listing of crops, vegetables, fruit, flowers, animal breeding, and other types.
Location of farming activities	Location of farmland where old farmers farm: indicated by city or county.
Whether or not farm exit took place	Whether old farmers decided to exit from farming: indicated 'farm exit' or other categories.

The intermediary variables

Intermediary variables are attitude to agricultural structural adjustment policy (farm exit policy, competitiveness policy, and rural development policy), attitude to farming, and attitude to farm exit barriers. The definitions of these are shown in Table 6.9.

Table 6.9 Definitions of intermediary variables

Variables	Definitions
Attitude to structural adjustment policy	The effect of structural adjustment policy on old farmers' decisions about whether to exit farming. Measured by the degree to which structural adjustment policy encourages old farmers to exit farming.

Attitude to farm entry policy	The effect of farm exit policy on old farmers' decisions about whether to exit farming. Measured by the degree to which farm exit policy encourages old farmers to exit farming.
Attitude to competitiveness policy	The effect of competitiveness policy on old farmers' decisions about whether to exit farming. Measured by the degree to which competitiveness policy encourages old farmers to exit farming.
Attitude to rural development policy	The effect of rural development policy on old farmers' decisions about whether to exit farming. Measured by the degree to which rural development policy encourages old farmers to exit farming.
Attitude to farming	Attractiveness of farming to old farmers as a job. Measured by the degree to which old farmers themselves consider farming attractive.
Attitude to farm exit barriers	Response of old farmers to farm exit barriers. Measured by the degree to which the various items appear as barriers to old farmers.

(Source: Own table)

The dependent variable

The dependent variable is farm exit. Farm exit means that an old farmer retires from farming either selling or leasing their whole farmland to their children or other farmers. Here, it is measured by whether or not farm exit takes place, as well as the degree of intention to exit farming which old farmers consider themselves to have.

6.5.4 A scale

As was seen in Section 6.5.3, measurement refers to assigning numerals to the attributes of subjects, that is to variables. Usually, a scale is used as an instrument to measure variables in

social research. A scale is a complex instrument which is comprised of items which are designed to measure variables (Corbetta, 2003) and it also includes the principles according to which numerals are assigned. Two concerns arise when designing a scale: one is related to the characteristics of the numerals; and the other is related to ways of composing a scale using a set of items.

6.5.4.1 Level of measurement

In the process of operational definition, numerals are assigned to categories. The meanings which these numbers have are usually called levels of measurement (Singleton, 1993). Rules which prescribe the meaning of the numbers fall into four types: nominal, ordinal, interval, and ratio measurement. They are also called nominal, ordinal, interval, and ratio variables (Bernard, 2000). Meanwhile, many statistical techniques require at least interval measurement, because interval and ratio scales alone can quantify the difference between values (O'Sullivan and Rassel, 1994).

In this research, independent variables like type, years of schooling, and grade were designated as nominal variables; but some variables, like farming career and number of children, were designated as ratio variables. All intermediary variables were designated as interval variables, and a dependent variable was designated as a nominal variable or an interval variable.

6.5.4.2 Scaling techniques

When measuring variables, there are three ways to do it. These are: a differential scale, a cumulative scale, and a summative scale. Of these, the Likert scale, which is a kind of summative scale, is widely used, due to its simpler construction and higher reliability. It is

also a common way of measuring attitude in samples (Bordens and Abbott, 1991). With the Likert scale, the attitude of respondents can be calculated by summation of the scores of items (Crano and Brewer, 2002). The multi-dimensionality of the social world is another reason why a summative scale like the Likert scale is widely used (Hoyle et al., 2001).

Meanwhile, a differential scale, like the Thurstone scale, is hard to construct, inefficient, and has lower reliability than summative scales (Hoyle et al., 2001). A cumulative scale, like the Guttman scale, has a higher probability of response error than summative scales, and it is not used because a uni-dimensional case is hard to find in the social world (Hoyle et al., 2001).

When using the Likert scale, the number of categories of items becomes an important concern. Usually, a scale has a maximum 10 categories, and it is desirable to have five categories or more (Bordens and Abbott, 1991) because respondents are intended to exclude extreme values. A five-point Likert scale is the most frequently used and is appropriate for measuring the attitudes of respondents (Sullivan, 2001). Meanwhile, it is argued that a scale of seven points increases reliability and validity (Crano and Brewer, 2002). In this research, a Lickert scale which consisted of expressions that represented degrees of agreement or disagreement with a five-point rating was used.

The five-point Likert scale used consists of the categories ‘strongly agree’, ‘agree’, ‘neutral’, ‘disagree’, and ‘strongly disagree’ and is regarded as an ordinal scale (Bernard, 2000; David and Sutton, 2004). But, by giving the categories numbers which have the same distance between them, response items on the Lickert scale can have numerical meaning. Therefore, despite controversy over its characteristics (Blaikie, 2003), the Likert scale is regarded as an interval scale (Leon et al., 2003).

6.5.5 Questionnaires as instruments of measurement

Writing questions or questionnaire items and putting a questionnaire in a logical order constitutes a part of data collection. A questionnaire is an economical method and it is a suitable one for obtaining information on sensitive topics. Questions in a questionnaire are divided into open-ended questions and closed questions. Closed questions ask respondents to select one or more from list of responses (O'Sullivan and Rassel, 1994). Therefore the method used by this type of questionnaire is called respondent-oriented (Chadwick et al., 1984). Despite its simplicity and efficiency, it has some disadvantages: it cannot get deep information in the way that open-ended questions can; people other than the intended respondents can fill out the questionnaire; or respondents can change their initial answers later (Chadwick et al., 1984). However, it is thought that the effects of these disadvantages can be reduced by in-person interviews.

In a closed-question questionnaire, items should be brief and the number of items should be restricted to get accurate information. Therefore, this kind of questionnaire should not exceed 11 pages or 125 questions (Dillman, 1978). The questionnaires in this research consisted of three pages and 45 questions. And data was also collected by in-person interviews to reduce the above-mentioned problems associated with closed questions.

6.5.5.1 The structure of the questionnaire on farm entry

The questionnaire on farm entry by prospective farmers consisted of seven sections and 43 questions, and it can be seen in Appendix C.1. The structure is summarized in Table 6.10 below.

Table 6.10 Structure of questionnaire for prospective farmers

Section	Variables	Relevance to hypothesis
# 1	Characteristics	- Independent variables in hypothesis - Relevant to H1, H2, H3, H4, and H5
# 2	Type	- Independent variable in hypothesis - Relevant to H1, H2, H3, H4, and H5
# 3	Attitude to farming	- Intermediary variable - Relevant to H3 and H5
# 4	Attitude to agricultural structural adjustment policy	- Intermediary variable - Relevant to H2 and H5
# 5	Attitude to farm entry barriers	- Intermediary variable - Relevant to H4 and H5
# 6	Intentions concerning farm entry	- Dependent variable which substitutes for the other dependent variable – whether or not the respondent enters farming after graduation – if it is not available
# 7	Farm entry	- Dependent variable - Relevant to H1, H2, H3, H4, and H5

Section 1 of the questionnaire was designed to get information on the characteristics of prospective farmers, their family, and their parent's farmland, and it consists of 10 questions of the kinds defined in Table 6.5. These variables were set as independent variables which affected farm entry directly or indirectly in the hypotheses.

Section 2 was designed to determine the types of prospective farmers, and it consists of 1 question. As is explained in Table 6.4, there are three categories of types. Respondents select one of the three categories to which they consider they belong. And type was set as an independent variable, as were the characteristics of prospective farmers.

Section 3 was designed to measure attitudes to farming as a job. It consists of five questions

which include attitude to farming income, living conditions in rural areas, and the social standing of farming. Attitudes to farming are used to verify whether they mediate between type and characteristics of prospective farmers and farm entry in Hypothesis 3 and Hypothesis 5.

Section 4 was designed to get information about attitudes to agricultural structural adjustment policy. Agricultural structural adjustment policy is divided into farm entry policy, competitiveness policy, and rural development policy, and therefore questions on attitude to agricultural structural adjustment policy are divided into three sub-sections and each sub-section has five questions. These are used to verify whether there is offset between the effects of farm entry policy, competitiveness policy, and rural development policy, whether they mediate between the independent variables and dependent variable of Hypothesis 2, and whether there is offset between the effects of attitude to farm entry policy, attitude to farming, and attitude to farm entry barriers.

Section 5 was designed to get information about farm entry barriers and attitudes to them, and is divided into two sub-sections. The first sub-section is about the kind of farm entry barrier that prospective farmers think will prevent them from becoming engaged in farming and the second sub-section is about attitudes to farm entry barriers they encounter. The second sub-section consists of five questions. Attitude to farm entry barriers is used to verify whether it mediates between the independent variables and dependent variable of Hypothesis 4 and whether there is offset between the effects of attitude to farm entry policy, attitude to farming, and attitude to farm entry barriers as referred to in Hypothesis 5.

Section 6 was designed to measure intentions concerning the farm entry of prospective farmers, and could be used as a dependent variable instead of the information about whether

or not farm entry took place if the information requested in Section 7 is insufficient.

Section 7 was designed to get information on whether or not farm entry took place after graduation, and this information is used as a dependent variable in all the hypotheses. It was made the last section to prevent the responses given to it from affecting responses given to questions in other sections.

6.5.5.2 The structure of the questionnaire on farm exit

The questionnaire on the farm exit of old farmers consists of seven sections and 45 questions, and it can be seen in Appendix C.2. The structure is summarized in Table 6.11 below.

Table 6.11 Structure of questionnaire for old farmers

Section	Variables	Relevance to hypothesis
# 1	Characteristics	- Independent variables in hypothesis - Relevant to H1, H2, H3, H4, and H5
# 2	Type	- Independent variable in hypothesis - Relevant to H1, H2, H3, H4, and H5
# 3	Attitude to farming	- Intermediary variable - Relevant to H3 and H5
# 4	Attitude to agricultural structural adjustment policy	- Intermediary variable - Relevant to H2 and H5
# 5	Attitude to farm exit barriers	- Intermediary variable - Relevant to H4 and H5
# 6	Intentions concerning farm exit	- Dependent variable which substitutes for the other dependent variable – whether or not the respondent exits farming or not, if it is not available.
# 7	Farm exit	- Dependent variable - Relevant to H1, H2, H3, H4, and H5

Section 1 of the questionnaire was designed to get information on the characteristics of old

farmers, their family, and their farmland. The kinds and definitions of information are given in Table 6.8. This information represents independent variables which affect farm exit directly and indirectly through attitude to farming, attitude to agricultural structural adjustment policy, and attitude to farm exit barriers.

Section 2 was designed to determine the types of old farmers, and it consists of 1 question. Types of old farmers, as is seen in Table 6.7, can be divided into three categories, and type is set as an independent variable in all the hypotheses, as are the characteristics of old farmers.

Section 3 was designed to get information about attitudes to farming, and it consists of five questions. Attitudes to farming are an intermediary variable in Hypothesis 3 and Hypothesis 5 which is affected by type and characteristics and which also affects farm exit.

Section 4 was designed to measure attitudes to agricultural structural adjustment policy. Agricultural structural adjustment policy is divided into farm exit policy, competitiveness policy, and rural development policy. Questions to measure attitudes to agricultural structural adjustment policy were divided into three sub-sections, according to the three types of policy, and each sub-section consists of five questions. These are used as intermediary variables between the independent variables and the dependent variable in Hypothesis 2 and Hypothesis 5.

Section 5 was designed to get information on attitudes to farm exit barriers, and is divided into two sub-sections. The first sub-section is about the kind of a farm exit barrier which prevents old farmers from exiting farming and the second sub-section is about attitudes to existing farm exit barriers, which are an intermediary variable in Hypothesis 4 and Hypothesis 5.

Section 6 was designed to elicit information about intentions concerning farm exit, and can be used as a dependent variable instead of information about whether or not farm exit took place if the information requested in Section 7 is insufficient.

Section 7 was designed to elicit information about whether or not farm exit has taken place. This is set as a dependent variable in the hypotheses. It was made the last section to prevent the responses given to it from affecting responses given in other sections.

6.5.6 Validity and reliability, and the test for these

Utilization of indicators and measurements on a scale raise the issue of reliability and validity (David and Sutton, 2004). And operational definition is another area that raises the same issues (Singleton et al., 1993). Therefore, reliability and validity are primary issues in relation to measurement and scales (O'Sullivan and Rassel, 1994), and a scale chosen for research must ensure validity and reliability.

The chosen method of measurement should guarantee that a researcher has measured what they wanted to, and when this happens it is called operational validity or validity. Validity is divided into face validity, content validity, and criterion validity (O'Sullivan and Rassel, 1994). First, face validity is related to whether concepts appear to be operationally valid, and it is about whether the instrument of measurement appears to be an appropriate means of measuring concepts. Face validity can be assessed by specialists. Second, criterion validity relates to the degree of consistency among the results produced by instruments which are designed to measure similar concepts. Criterion validity can be divided into concurrent validity and predictive validity, according to the time of measurement. Criterion validity can be verified by comparing the results which are produced by instruments (Neuman, 2006), and

regression analysis or correlation analysis can be used to assess it. Third, content validity is a type of face validity, and means the degree of comprehensiveness of the instrument which is meant to measure complex concepts.

Construct validity is referred to in the case of multi-item instruments, and it is divided into two categories: convergent validity, and discrimination validity. The former is the degree of consistency between responses on items which are designed to measure the same concepts; and the latter means the degree of independence between responses to items which are designed to measure different concepts (Neuman, 2006). These can be assessed by factor analysis.

In addition to this, validity is divided into internal validity, that is the reproduction of a research method, and external validity, that is the replication of its result (Neuman, 2006). Internal validity means that changes in dependent variables are due to the change in independent variables, not to other external factors. And external validity means the generalizability of a research result to the population as a whole. Scientific measurement and representative sampling contribute to the increase of external validity (David and Sutton, 2004).

Meanwhile, reliability means getting the same responses whenever researchers measure the same concepts with the same instrument, and therefore it is related to the possibility of random error in measurement. Reliability is divided into stability, equivalence, and internal consistency (O'Sullivan and Rassel, 1994; Chadwick et al., 1984). First, stability is reliability in terms of time, that is the degree to which the same responses were obtained at different times, and this can be investigated by the test-retest method. Second, equivalence refers to the degree to which the same responses are obtained between different scales or between items

which are designed to measure the same concept. Finally, internal consistency is item-related reliability, that is the degree of consistency in responses to items which are constructed to measure the same concepts. Internal consistency becomes significant when multi-items are used to measure a concept and it can be measured by the split half method (Neuman, 2006). Usually, ensuring the clarity of concepts tested, pilot testing, and an increase in the level of measurement are believed to increase reliability (Neuman, 2006). And reliability also increases as the number of items tested increases (O'Sullivan and Rassel, 1994).

This research mainly used the factor analysis technique to test validity, and the strategies of pilot testing and coefficient alpha were also used to test reliability.

6.5.7 Sampling

6.5.7.1 Sampling methods and issues

Sampling means the selection of units to test, that is people, regions, and organizations from a population are tested. There are two kinds of sample design: probability sampling and non-probability sampling. When sampling, there are two important points to focus on: the types of sampling method or sampling technique that are appropriate; and the number of samples that are required to ensure the validity of the result.

The appropriateness of the sampling method chosen for research is dependent on generalizability, the availability of a sampling frame, and budget size. From the perspective of generalizability, probability sampling methods like simple random sampling, stratified sampling, systematic sampling, cluster sampling, and multi-stage sampling are preferred to non-probability sampling methods. But, probability sampling methods are not always realistic when considering problems related to cost and time, the need for a sampling frame, and the

purpose of the research. Under these constraints, non-probability sampling, like convenience sampling, purposive or judgment sampling, quota sampling, and snowball sampling can be used, even though it can be less accurate than estimating the characteristics of a population from statistics relating to that population (O'Sullivan and Rassel, 1994). Therefore, realistic sampling methods can be alternatives to ideal ones when some of the constraints are considered.

Decisions taken on sampling size seem to be more complex. This is because there is no one answer to of the question of how many samples are required for investigation. Usually, sampling size depends on the characteristics of the population, like the degree of heterogeneity (Chadwick et al., 1984), population size, confidence level, sampling error (Sullivan, 2001), and the time and cost of the research (Weinberg, 1983). In addition to these, the number of independent variables (Morris, 2007) and the ratio of sample unit to population also affect sampling size (Sullivan, 2001).

In relation to sampling size, there have been some arguments on what is an acceptable minimum size for a sample. According to Sudman (1983), the number of sampling units which are included in a sub-group needs to be 20 or more. Others have argued that the minimum sample size needs to be 30 (Sullivan, 2001) or 100 (Bailey, 1987; Champion, 1981), or 200 (Chadwick et al., 1984). And Neuman (2003) said that the sampling ratio is inversely proportional to the size of the population sampled. Meanwhile, according to Sullivan (2001), the required size of a sample from a population of 1,000 thousand elements is from 245 for a homogeneous population to 383 for a heterogeneous population when a sampling error of 5% and a confidence level of 95% are allowed. And in the case of a population of 25,000, the sample size is from 244 for a homogeneous population to 378 for a heterogeneous population

living under same conditions. However, it seems that the development of statistical techniques has contributed to the solution of the problem of sampling size.

6.5.7.2 Farm entry

As of 2007, the population of prospective farmers is students who attend the 29 agricultural high schools and two agricultural colleges in Korea. And this population size is estimated at about 16,000, which is made up of about 14,000 agricultural high school students and about 2,000 agricultural college students.

For this research, the sample was selected through cluster sampling and probability sampling. This was because the population was dispersed geographically and the sampling frame was scarcely available, due to the requirement for privacy. Cluster sampling is thought to contribute to savings in time and cost, even though it may be less accurate than simple random sampling. Five high schools and one agricultural college were chosen by random sampling and then the students who attended those schools were randomly sampled. Before sampling the five high schools, those schools were chosen according to their administrative regions, that is one from each of Kyung-gi, Kang-won, Chung-cheong, Kyoung-sang, and Jeon-la. This was done to prevent all the schools sampled belonging to the same administrative region.

Meanwhile, according to Sullivan (2001), a sample size of 250 is not insufficient when the homogeneity of students is considered. The homogeneity of the students sampled is estimated from the fact that they are all of similar ages, they all attend similar schools, and they all live in a rural area.

6.5.7.3 Farm exit

Old farmers are defined as farmers who are aged 60 and over. As of 2007, the population in Korea included approximately 753,000 people who were engaged in farming and qualified as farmers according to the Framework Law for Agricultural and Rural Areas. From the perspective of generalizability, although probability sampling would be regarded as the ideal method to use in this case, it was not realistic to use this method for the following reasons. It would scarcely have been possible to construct a sampling frame, because there was no way of confirming whether or not old people who lived in rural areas were engaged in farming. Further, it was considered too expensive and time-consuming to use this method, because the sample units were dispersed geographically across Korea. Given these considerations, judgment sampling was deemed an appropriate technique. Although judgment sampling does not guarantee greater generalizability than simple random sampling, it is possible to improve the likelihood of generalizability by selecting samples which are thought to accurately represent the population.

In this research, judgment sampling was used. Two counties (County A and County B), which are shown in Figure 6.3, were chosen as likely to represent the characteristics of Korean farming from the perspective of the distribution of farm products, farm income, farm size, and farmers' age. Then, 16 villages were randomly selected from the two counties and inhabitants who farmed there were randomly sampled by visiting those villages. Based on the ideas of Sullivan (2001), a sample of 250 would not be insufficient when considering the homogeneity of a group of old farmers. The homogeneity of such a population is based on the fact that they are of a similar age, have received a similar amount of schooling, have the same job, and live in a rural community.

County A lies in the mid-south of Korea. The main industry of the county is farming, which accounts for 77% of the gross product of the county. There are about 26,000 households and about 64,000 people live there. Of these, about 21,000 people (33%) from about 9,000 farm households (35%) are engaged in farming. And the average age of these farmers is increasing. The number of farm households whose operators are aged 60 and over is about 50%, and the number of old farmers who are aged 60 and over is 53%. In this county, rice fields occupy 6,676 ha (61%) of the 11,376 ha of farmland, and the average amount of farmland per farm household is 0.80 ha. These statistics indicate that this county has characteristics that are typical of the farming industry in Korea, such as aging farmers and small farms.

County B is located in the far south-west of Korea, and faces the Southern sea. The farming industry accounts for 57% of the gross product of the county. There are about 18,000 households and about 41,000 people live in the county. The number of farm households is about 7,000 (40%) and the number of people who are engaged in farming is 37,000 (40%). The number of farm households whose operators are aged 60 and over and the number of old farmers who are aged 60 and over are 4,000 (60%) and 9,000 (60%) respectively. Rice fields occupy 87% of the total farmland and the average amount of farmland per farm household is 1.9 ha.

Figure 6.3 Locations of sampled counties in Korea

(Source: http://maps.yahoo.com)

6.6 Data collection

6.6.1 Types of survey and issues

When doing a survey, the method chosen for contacting people becomes one of the primary issues. In a survey, data are collected by methods like mail survey, telephone survey, and in-person survey. Of these techniques, mail survey is the cheapest, but is more appropriate for well educated people (Neuman, 2003). Telephone surveys are cheaper than in-person surveys, but they have limitations in terms of interview time and types of question. In-person surveys, which can include personal interviews, group discussions, and group interviews, are the most reliable of the other techniques (Weinberg, 1983). This technique is appropriate for obtaining data from old people (Morris, 2006); and its ratio of response is the highest (Neuman, 2006). However, there are disadvantages in that the attitude and ability of the interviewer can affect the results (Neuman, 2006). It also requires more time and expenditure than other techniques

like telephone interviews (Morris, 2006).

6.6.2 The type of survey used for farm entry

In the case of the survey of farm entry intentions among prospective farmers, an in-person survey using the questionnaire with closed questions and in-person interviews were conducted. Using an in-person interview method at the sample schools was expected to contribute to savings in time and cost, to produce a higher response rate, and to increase the quality of the data. To conduct the survey, I visited selected schools and distributed questionnaires to students who were in class and in the playground. The questionnaires were gathered in as soon as they had been filled in, which was meant to save time and increase the response rate. Then, in-person interviews were also conducted to get deeper information which could not be obtained through the self-administered questionnaire: for example, information on why these young people might not want to do farming.

6.6.3 The type of survey type used for the exit of old farmers

An in-person survey using a structured questionnaire was conducted to collect data from old farmers. As a result of a pilot survey (Feb 10, 2009 – Feb 17, 2009), it was thought that a self-administered survey was not appropriate for old farmers, because some of them said they were not accustomed to thinking in terms of a scale of answers. In addition, more reliable and deeper data can be obtained from in-person interviews. Therefore in-person surveys of people or groups of people were conducted. I visited selected villages in the two counties and met old people, with the help of the staff of regional agricultural cooperatives. In the community room of each village, I distributed the questionnaire and explained each question in turn. Then, the old people went through the questions one by one. In addition to this, I interviewed some old

people to get deeper information on farm exit: for example, on why they did not want to exit farming.

6.6.4 Ethical issues

Major ethical issues which can be brought up with this kind of survey are the invasion of privacy, the compulsion of participation and response, and the pursuit of unrevealed goals by those conducting the survey. When the pilot survey was conducted, it was found that old people were sensitive about participating in, and responding to, the survey, because they were worried that their responses might have a negative impact on their villages and their farming. This was partly due to the fact that I had worked as an agricultural policy-maker at the Ministry of Agriculture and Forestry.

Therefore, this research tried to respect respondents' right to privacy and their wishes through the following measures. I got permission from the village headmen before I visited the villages and promised not to reveal the names of villages which had been investigated or the respondents' profiles. When respondents were contacted, they were informed that they did not need to participate in the survey if they did not want to, and they did not need to provide any information that they did not want to provide. In addition, the aims of this research were explained to respondents during the survey. In particular, it was explained that this research was purely aimed at contributing to the development of farm entry and exit study, and would not, therefore, be directly used in policy making, although I had worked as an agricultural policy maker. The emphasis on my research aims was because the village headmen were worried that the results of the survey would be used in a way that was unfavorable to the villages or the respondents.

6.7 Data analysis

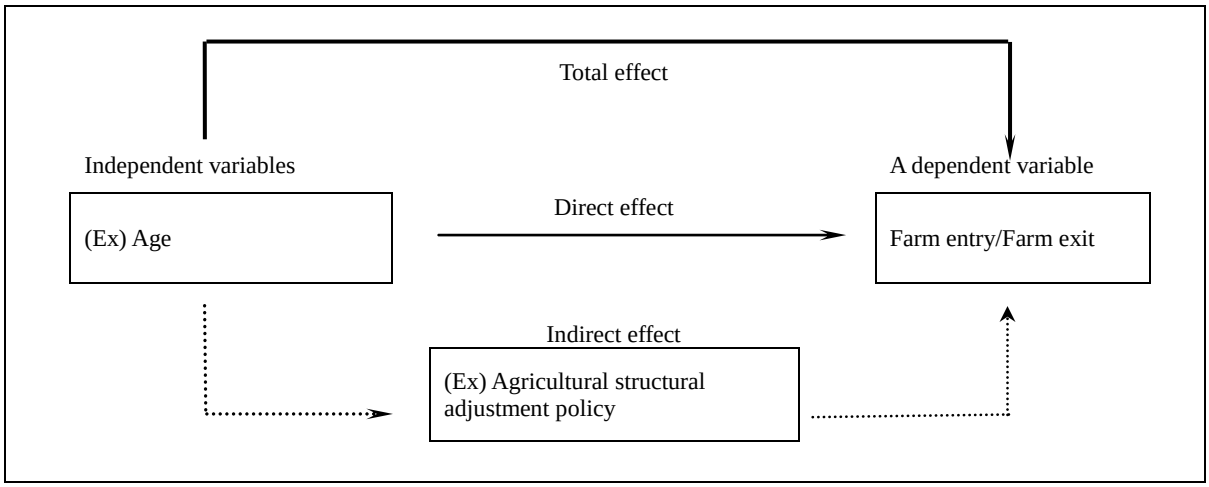
Data analysis is the process of eliciting meaning from the data which are obtained from a survey (Sullivan, 2001). In a survey with a structured questionnaire, data is represented in the form of numerals and these have to be manipulated to yield their meaning. In the surveys described above, the numerical data went through the process of collection, assignment, classification, and relationalization. The statistical techniques which are used to analyze data depend on the level of measurement, the research goals, the number of variables, the degree of knowledge of statistics, and on the requirements of the statistical package being used: for example, they depend on whether the data present a normal distribution or not.

6.7.1 An analysis model

The objective of this research is to test whether the personal characteristics of prospective and old farmers affect farm entry and farm exit directly (Hypothesis 1) or indirectly through intervening variables like attitude to agricultural structural adjustment policy, attitude to farming, and attitude to farm entry and farm exit barriers (Hypotheses 2, 3, 4, and 5).

This can be analyzed in two ways. One is to test whether the personal characteristics of prospective farmers and old farmers affect farm entry and farm exit directly (direct effect), and this is represented as a thin solid line in Figure 6.4. The other is to test whether the personal characteristics of prospective farmers and old farmers affect farm entry and exit indirectly through the three intermediary variables (indirect effect), and this is represented as a dotted line in Figure 6.4 The total effect, which is represented as thick sold line, is the sum of direct effect and indirect effect.

Figure 6.4 Farm entry and farm exit analysis model



(Source: Own table)

Mediation and Moderation

The distinction between a mediator and a moderator has attracted the interest of researchers (Kraemer et al., 2001). The relationship between the three variables, i.e. independent variable, dependent variable, and the third variable, can be explained from many different perspectives (Mackinnon, 2009). When the third variable is located in the causal relationship between an independent variable and a dependent variable, it is called a mediator (Mackinnon, 2000) or an intervening or process variable (Kenny, 2009). But a moderator only affects the strength or direction of the causal relationship between them, without intervening in it (Mackinnon, 2009). So, the definitional difference between them is not always apparent. And therefore, "The decision about whether a variable is a mediator or moderator should be based on theory and the conceptual framework that guides the research" (Bennett, 2000: p.416).

The models used in this research (Figure 6.1 and Figure 6.2) can be explained by a mediation model in which attitudes, i.e. mediators, intervene in the causal relationship between personal characteristics, i.e. independent variables, and farm entry or farm exit, i.e. a dependent

variable. But the model can be also explained by a moderation model where the relationship between attitudes and farm entry or farm exit is different according to the level of personal characteristics. Meanwhile, this model can be extended to mediated moderation or moderated mediation (See Muller et al., 2005) in experimental study.

This research conceptualized the relationship between the three variables in a mediation model, and the bases are as follows. On the basis of previous theories discussed in Section 2.4, this research hypothesizes that personal characteristics (independent variables) affect farm entry or farm exit (a dependent variable). An objective of this research is to elucidate how personal characteristics affect farm entry or farm exit, which is about the process by which the two variables are related (Mackinnon, 2009), and, on the basis of previous studies, agricultural structural adjustment policy is expected to intervene in the relationship. To verify the effect of agricultural structural adjustment policy on this relationship, this research also adopts the theory of relationship between attitude and behavior, where attitude directly affects behavior. In doing so, attitude to agricultural structural adjustment policy is included in the model as the third variable, which intervenes in the relationship between personal characteristics and farm entry or exit. And if the relationship between personal characteristics and farm entry or exit is significant, attitudes explain how personal characteristics affect farm entry or exit by the causal relationship between the three variables – personal characteristics, attitudes, and farm entry or exit.

6.7.2 Approaches to direct effect analysis

The direct effect of personal characteristics on farm entry and farm exit is tested by binary logistics regression analysis controlling intermediary variables. Binary logistics regression analysis is used to test the influence of an independent variable on a dependent variable when

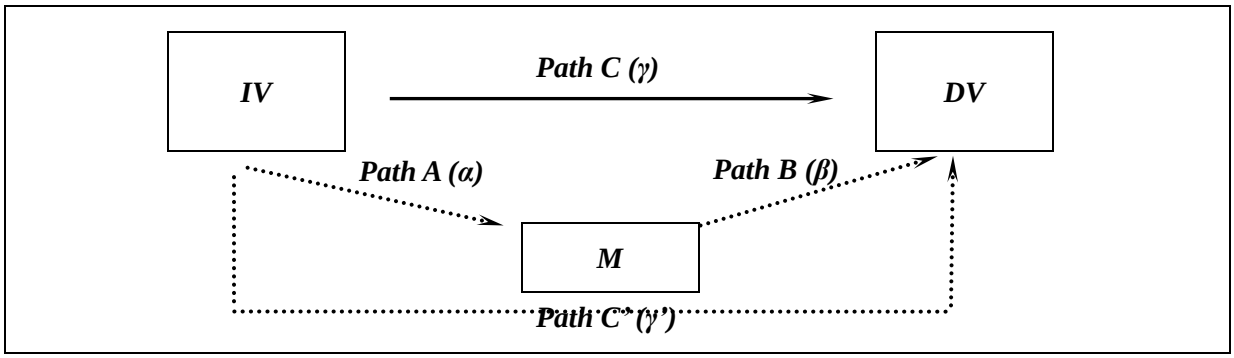
the dependent variable is measured by a dichotomous nominal scale, like whether farm entry takes place or not, or whether farm exit takes place or not. Binary logistics regression analysis is more appropriate than discriminant analysis because it does not assume a multivariate normal distribution of dichotomous variables (Mackinnon, 2008).

6.7.3 Approaches to indirect effect analysis

6.7.3.1 General approaches

Mediation effect analysis is used to test indirect effect. Figure 6.5 below shows a single mediation effect analysis model. Where IV denotes an independent variable, DV denotes a dependent variable, and M denotes a mediator or an intervening variable. Path A designates the effect of an independent variable on a dependent variable, and α is the path coefficient between the two. Path B designates the effect of a mediator on a dependent variable, and β is the path coefficient. Path C designates the effect of an independent variable on a dependent variable without controlling a mediator, and γ designates the path coefficient. Finally, path C' designates the effect of an independent variable on a dependent variable through mediators, and γ' is the path coefficient. Therefore, the total effect is γ, the direct effect is γ', and the indirect or mediated effect is γ- γ'. And γ- γ' is the same with αxβ (MacKinnon, Warsi, and Dwyer, 1995).

Figure 6.5 A model of single mediation effect analysis



(Source: Partially adapted from Preacher and Hayes (2008: p.880))

The method of testing mediation effect analysis can be categorized in three ways (Mackinnon 2009, Preacher and Hayes, 2004; Mackinnon and Lockwood et al., 2002). One is called the causal steps approach (Baron and Kenny, 1986; Judd and Kenny, 1981), and this tests causal relationships between independent variables, mediators and dependent variables, and estimates the mediation effect by whether a significant relationship is found among them. The second is called the path coefficient test, and this is further categorized in two ways. One way is to test the products of path coefficients (αβ), as in the cases of Sobel (1982, 1988); and the other is to test the difference of the path coefficient (γ-γ'), as in the cases of Freedman and Schatzkin (1992). Meanwhile, ANOVA can be used to test a meditational hypothesis, but it is not an appropriate method (Fiske, Kenny, and Taylor, 1982).

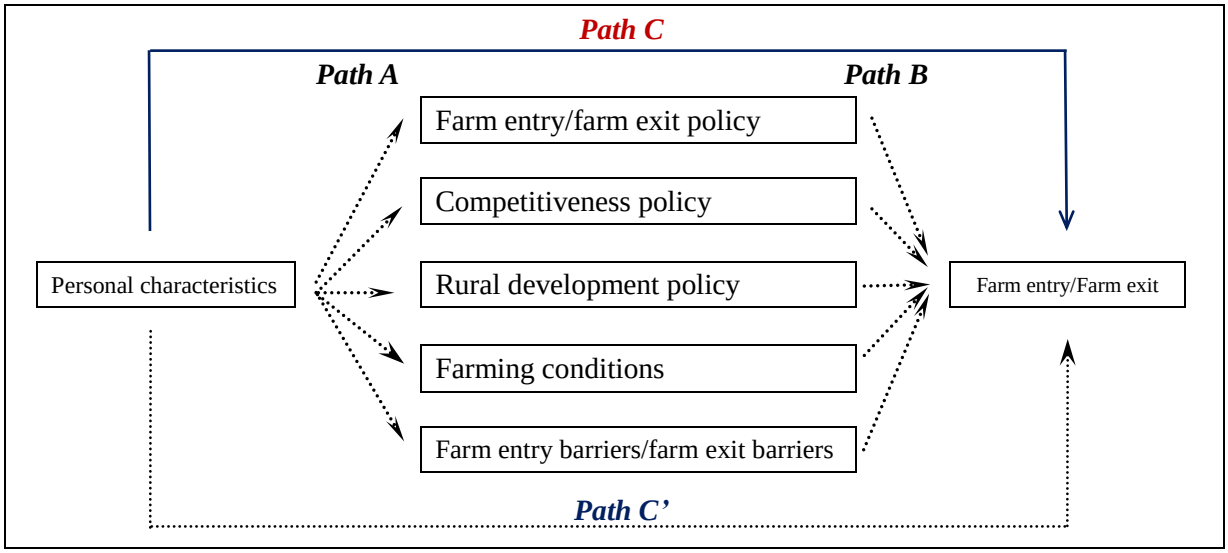
Of these, the most common method of mediation effect analysis was the causal step test (Mackinnon, 2000) which uses regression analysis technique (Baron and Kenny, 1986). According to the three-step mediation effect analysis used by Baron and Kenny (1986), the following conditions must be satisfied to prove a significant mediation effect. First, an independent variable significantly affects a mediator, that is, path A must be significant in Figure 6.5. Second, an independent variable must also significantly affect a dependent

variable, that is, path C must be significant. Finally, an independent variable also affects a dependent variable when a mediator is controlled, that is, path C' must be significant. In addition, the effect of the first test should be greater than that of the third test, that is, $\gamma > \gamma'$. Meanwhile, the assumption of multivariate normality for the standard error of the indirect effect should be satisfied, and this can be tested using Sobel's (1982) significance test.

However, a problem of the causal step approach is that it does not calculate the size of the mediation effect and the confidence interval. Further, the causal step method cannot be applied for multiple mediation cases. Due to these disadvantages, the causal step approach is regarded as inappropriate for mediation effect analysis (Mackinnon and Lockwood et al., 2002). Therefore, the method of using coefficients was developed by Mackinnon, Warsi, and Dwyer (1995), and this estimates the mediation effect by both difference of correlation coefficient ($\gamma - \gamma'$) and multiplication of the coefficient ($\alpha x \beta$). The statistical mediation test can be done using statistical packages like SPSS, SAS, LISREL, AMOS (Mackinnon, 2008).

6.7.3.2 Multiple mediation effect analysis

Figure 6.6 A multiple mediation analysis model for farm entry and exit



(Source: Own figure)

Figure 6.6 above shows a multiple mediation analysis model in which the independent variables are type and characteristics, the dependent variable is farm entry or farm exit, and the mediators are attitudes to farming, farm entry and exit policy, competitiveness policy, rural development policy, and farm entry and exit barriers.

If there are multiple mediators, mediation effect analysis can be done independently by mediator or simultaneously (Kenny, 2008). When it is tested independently, by mediator, the mediation effect can be verified by standardized regression coefficient and partial correlation coefficient (Mackinnon, 2000). But when the test is conducted simultaneously, it is possible to verify the relationship between mediators as well as the size of the estimated mediation effect of each of the mediators (Kenny, 2008).

Meanwhile, a covariance structure model approach is also recommended (Mackinnon, 1994) as a method of testing mediation effect. This is because a structural equation model makes it

possible to estimate the mediation effect directly controlling measurement error (Preacher and Hayes, 2004). In this case, total effect, direct effect, mediation effect, and the standard errors of these can be calculated by covariance structure modeling programs like EQS and LISREL (Mackinnon, 2000).

6.7.3.3 Data analysis method of this research

The direct and indirect effects of independent variables on a dependent variable through the five mediators was tested by adopting the macros of Preacher and Hayes (2008). And the mechanism and procedures involved in this were as follows.

First, all the paths in Figure 6.6 were estimated by ordinary least square (OLS) regression analysis. But when the dependent variable was a nominal or a dichotomous scale, it was analyzed by binary logistics regression analysis.

Second, the mediation effect was estimated by the multiplication of α and β. And the significance of the mediation effect was verified by the bootstrapping technique, which estimates standard errors and computes confidence intervals from 5000 bootstrapped samples.

Third, categorical independent variables like age and years of schooling, which have 'n' categories, were dummy coded and tested 'n-1' times by controlling the others as covariates.

Fourth, when there were 'k' independent variables, 'k' instances of mediation effect analysis were conducted.

Fifth, when a dependent variable was dichotomous, like farm entry or farm exit, normal distribution was not assumed, and therefore the total and indirect effects were not verified by standard errors and Z values for them. It was the same when covariates were included in the

model.

Finally, when suppressors like farm entry and exit barriers intervened between independent and dependent variables, these could be treated in the same way as facilitators, because the effects of facilitators and suppressors were equivalent in the model (Preacher and Hayes, 2004).

6.8 Summary and conclusion

This chapter has described the methods used in this research in detail, and the following major concerns have been dealt with. Research philosophies, paradigms, and research strategy were discussed (Section 6.2). A survey method was selected as an appropriate research method, taking account of the research paradigm, the inquiry type, the research objective, and the required data, and it was justified. Although a survey was mainly used to test the hypotheses, an open-ended interview method was also adopted to supplement it (Section 6.4). The research design issues related to the research method, such as measurement, scale, survey type and sampling technique, were discussed, and the way of applying these to this research was explained (Section 6.5). And it was indicated that in-person questionnaire surveys and in-person interviews were used to collect data (Section 6.6). Finally, a data analysis method, that is a multiple mediation effect analysis which used multiple regression analysis, binary logistics regression analysis, and bootstrap technique, was discussed (Section 6.7)

CHAPTER 7

DATA ANALYSIS AND INTERPRETATION

7.1 Introduction

This chapter analyzes the data which were obtained from the surveys and open-ended interviews, applying statistical procedures, and it tests the hypotheses. Data is understood as a source for addressing research questions, and data analysis and interpretation are defined as a process which produces information relevant to the research hypotheses. So, how are data analyzed and turned into information? There are two kinds of statistical method used for data analysis: descriptive statistics, and inferential statistics. Descriptive statistics enables the researcher to describe samples and measurements by summarizing and classifying them to find patterns, and these finally become the basis of quantitative analysis. On the other hand, inferential statistics techniques, like regression analysis, are used to make inferences from the data, as happens in parameter estimation. Inferential analysis is done with the assumption that data are reliable and valid, and therefore reliability and validity tests are required if inferential statistics is to be used. Finally, information is extracted by interpreting the results of data analysis.

This chapter is divided into sections on farm entry and farm exit. In Section 7.2, data from prospective farmers are analyzed and interpreted. The personal characteristics of prospective farmers, like sex and birthplace, are described in order to comprehend their distribution (Section 7.2.2.), and the distribution and dispersion of responses to questions on attitudes to farming, agricultural structural adjustment policy, and farm entry barriers, and on whether the prospective farmers were likely to enter farming or not, are also described (Section 7.2.3.1).

Scaling analysis is conducted to test whether the instruments, for example, the questionnaire, and the measurements, are reliable and valid (Section 7.2.3.2). Finally, the hypotheses are verified by inferential statistical techniques (Section 7.2.4) and the results are interpreted. Section 7.3 is about the farm exit of old farmers, and it is developed in the same way as described above for farm entry.

7.2 Farm entry of prospective farmers

7.2.1 Questionnaire distribution and collection

I visited six schools, including five high schools and one agricultural college, between February 23, 2009 and March 5, 2009. Four hundred and fifty one questionnaires were distributed to the students in the classrooms or playgrounds of the six institutions. Of these, 397 questionnaires were collected, which represented about 88% of the questionnaires given out. The high retrieval rate was due to the data collection method of an in-person survey. Of the 397 questionnaires collected, 52 which missed out some information like personal characteristics or responses to questions were eliminated. Finally, 345 questionnaires were accepted as valid and the data were analyzed.

The Statistical Package for Social Sciences (SPSS) 17.0 was used for computing descriptive statistics, internal consistency and validity ratings, and hypotheses were tested by carrying out binary logistics regression analysis, multiple regression analysis, and bootstrapping.

7.2.2 Description of participants' personal characteristics

The personal characteristics of participants were classified into three kinds: personal, familial, and farmland. In addition, type, which was discussed in Chapter 5, was added as one of the characteristics. All these characteristics were set as independent variables.

Individual characteristics

Table 7.1 shows the frequencies and percentages of individual characteristics of prospective farmers. They include grade, major subject, sex, sibling ranking, birth place, and whether respondents had farming experience or not.

Table 7.1 Descriptive statistics on personal characteristics of prospective farmers (N=345)

Characteristics	Categories	Frequencies	Percentages	Cumulative ratios
Grade	1st grade	31	9.0	9.0
	2nd grade	107	31.0	40.0
	3rd grade	207	60.0	100.0
Major subject	Crops	10	2.9	2.9
	Livestock	80	23.2	26.1
	Horticulture	147	42.6	68.7
	Food processing, other produces	76	22.0	90.7
	Landscape	32	9.3	100.0
Sex	Male	238	69.0	69.0
	Female	107	31.0	100.0
Sibling ranking[4]	The eldest	186	53.9	53.9
	Others	159	46.1	100.0
Birthplace	City	187	54.2	54.2
	County	158	45.8	100.0
Farming experience	Experienced	149	43.2	43.2
	Others	196	56.8	100.0

Characteristics of families

Table 7.2 below shows the frequencies and percentages of characteristics of prospective farmers' families, which include parents' job and number of siblings.

[4] If a respondent has no sibling, he/she is categorized into the oldest group.

Table 7.2 Descriptive statistics on characteristics of prospective farmers' families (N=345)

Characteristics	Categories	Frequencies	Percentage	Cumulative ratio
Parents' job	Farming	154	44.6	44.6
	Non-farm job	191	55.4	100.0
Number of siblings	0 people	23	6.7	6.7
	1 person	77	22.3	29.0
	2 people	140	40.6	69.6
	3 people	75	21.7	91.3
	4 people or more	30	8.7	100.0

Characteristics of parents' farmland

Table 7.3 below shows the frequencies and percentages of the characteristics of prospective farmers' parents' farmland. They include location of farmland and farm produce.

Table 7.3 Descriptive statistics on characteristics of prospective farmers' parents' farmland (N=345)

Characteristics	categories	Frequencies	Percentages	Cumulative ratio
Location	City	53	15.4	15.4
	County[5]	101	29.3	44.6
	Non-farming	191	55.4	100.0
Farming produce	Crop farming	60	17.4	17.4
	Livestock farming	65	18.8	36.2
	Crop and livestock farming	18	5.2	41.4
	Horticulture, landscape and other produces	11	3.2	44.6
	Non-farming	191	55.4	100.0

Type

Table 7.4 below shows frequencies and percentages of type for prospective farmers.

[5] Unlike England, in Korea county refers to a rural area but city refers to an urban area. That is, in Korea a county can not include a city, and the two are the opposites of each other.

Table 7.4 Frequencies and percentages of type for prospective farmers (N=345)

Variables	Categories	Frequencies	Percentage	Cumulative ratio
Types	Farming preference type	78	22.6	22.6
	Risk averse type	155	44.9	67.5
	Non-farm job preference type	112	32.5	100.0

7.2.3 General findings

7.2.3.1 Attitudes to farming, agricultural structural adjustment policy, farm entry barriers, and farm entry

Attitudes to farming

Five questions were asked to measure attitudes to farming as a job and Table A.1 in Appendix A represents means and standard deviations of attitudes to farming. On the whole, prospective farmers did not have highly positive or highly negative attitudes to farming as a future job (M=2.96, SD=.852). They showed positive responses to the worth of farming (M=3.22, SD=.901) and the quality of life in rural areas (M=3.03, SD=.889), but they showed negative responses to farming income (M=2.95, SD=.853), the social standing of farmers (M=2.83, SD=.883), and recommending farming to their friends (M=2.74, SD=1.102). It seemed that they felt that farming was not profitable, not socially desirable, and not a job to be recommended, although they did not think of farming as an unworthy occupation.

Attitudes to structural adjustment policy

Agricultural structural adjustment policy was divided into three sub-policies: farm entry policy, competitiveness policy, and rural development policy. Five questions were asked about each policy in order to measure attitudes to these.

First, Table A.2 in Appendix A represents frequencies, means (M) and standard deviations (SD) of attitudes to farm entry policy. As a whole, prospective farmers showed positive responses to farm entry policy (M=3.10, SD=.652). Of the policies, the provision of education in agricultural schools was the most influential for them (M=3.20, SD=.678), but the internship program was the least influential (M=2.99, SD=.753). This indicates that education in schools might be a more effective farm entry policy than financial support (M=3.11, SD=.837) and farming assistance programs on farms.

Second, Table A.3 in Appendix A shows frequencies, means, and standard deviations of attitudes to competitiveness policy. Respondents answered that competitiveness policy acted as an incentive to farm (M=3.03, SD=.843), contributed to farming prospects (M=3.15, SD=.857), contributed to an increase in income (M=3.17, SD=.876), and made farming more attractive (M=3.01, SD=.821). These people wanted to benefit from the policy (M=3.26, SD=.963). From these results, it can be estimated that competitiveness policy could encourage prospective farmers to engage in farming.

Third, Table A.4 in Appendix A shows frequencies, means, and standard deviations of attitudes to rural development policy. Respondents answered that rural development policy could contribute to farming prospects (M=3.08, SD=.860), increase income (M=3.14, SD=.815), and increase the attractions of farming (M=3.05, SD=.812), although they thought that the policy did not act as an incentive to farm (M=2.96, SD=.867). These responses indicate that rural development policy could indirectly encourage prospective farmers to do farming.

Attitudes to farm entry barriers

As is seen in Table A.5 in Appendix A, of those farm entry barriers which were mentioned by prospective farmers, shortage of funds, low farming income, and the low social status of farmers each scored over 20%; and they were followed by lower quality of life in rural areas than in urban areas (15%), and the difficulty of learning farming skills (10%). This shows that not only financial and economic problems but also social and regional disadvantages are influential farm entry barriers.

The frequencies, means, and standard deviations of attitudes to farm entry barriers which the above mentioned respondents designated are shown in Table A.6 in Appendix A. These people answered that farm entry barriers would not make them negative towards farming (M=2.99, SD=.753) and would not discourage them from doing farming (M=3.11, SD=.837). And they were confident that they could overcome farm entry barriers (M=3.16, SD=.831), but would undertake farming even if those barriers were not overcome (M=3.04, SD=.774). Accordingly, it can be estimated that prospective farmers are not likely to be negatively affected by farm entry barriers.

Attitudes to farm entry

Table A.7 in Appendix A shows the frequencies, means and standard deviations of five items used to measure attitudes to farm entry. Those questioned showed negative responses to their aptitude and capability for farming (M=2.77, SD=1.005), the possibility of being a successful farmer (M=2.78, SD=1.070), and living in a rural area (M=2.85, SD=1.151). They were not preparing to enter farming (M=2.74, SD=1.148) and they even thought that it was not satisfying for people to be engaged in farming (M=2.83, SD=1.178). This shows that prospective farmers tended to be negative towards being a farmer, even though they were attending agricultural schools which were established to promote young farmers.

Prospective farmers were also asked whether they would engage in farming after graduation. Responses showed that 27% of prospective farmers were determined to engage in farming shortly after graduation, but the rest had not yet decided, or had decided they would not engage in farming, as can be seen in Table A.8 in Appendix A.

7.2.3.2 Reliability and validity tests

Reliability test

A measurement is reliable if it produces consistent scores for the same concepts. And reliability, that is, internal validity, can be estimated by test-retest, equivalent forms, and internal consistency approaches like coefficient alpha and split half reliability. In this research, internal consistency was estimated using Cronbach's alpha coefficient, for which the degree of reliability is proportional to the alpha coefficient. Generally, with Cronbach's alpha coefficient, a score of from .60 to .70 is regarded as satisfactory reliability; .70 to .80 is regarded as good reliability; and .80 to .95 is regarded as excellent reliability (Sitarenios, 1999). In this research, the coefficient alphas of five concepts ranged from .66 to .93, as is seen in Table 7.5, which shows that the measure is satisfactorily reliable at least.

Table 7.5 Reliability test statistics for prospective farmers

Variables(Questions)	Initial Items	Items after elimination	Coefficient Alpha
Attitudes to farming as job (Ⅲ.1-Ⅲ.5)	5	5	.816
Attitudes to farm entry policy (Ⅳ.1.1-Ⅳ.1.5)	5	5	.871
Attitudes to competitiveness policy (Ⅳ.1.1-Ⅳ.1.5)	5	5	.890
Attitudes to rural development policy (Ⅳ.1.1-Ⅳ.1.5)	5	5	.868
Attitudes to farm entry barriers (Ⅴ.2.1-Ⅴ.2.5)	5	5	.659
Attitudes to farm entry (Ⅵ.1-Ⅵ.5)	5	5	.930

It can be difficult to measure concepts accurately, due to measurement error, even if multi-item scales are used. In this case, item analysis can be done by reliability test to exclude items

from the scale which are thought not to be related to the concepts (Green, 2008). And factor analysis can be used as another way of item analysis, as is shown in the following section on testing for validity.

Validity test

The concepts which were used in this research, like attitudes to farming, farm entry policy, competitiveness policy, rural development policy, and attitudes to farm entry barriers, were already proven to affect farm entry and exit. And the scale had been reviewed by an agricultural college professor in Korea and public officials who were in charge of agricultural structural adjustment policy in the Ministry of Agriculture and Forestry. So it cannot be said that its content was devoid of validity.

Factor analysis is used as a statistical technique to assess construct validity. It is also used as a data reduction technique, because it helps reduce a large number of items to smaller factors, i.e. dimensionalities. And it can also be utilized when excluding items from a scale. When verifying construct validity, two kinds of factor analyses can be done: exploratory factor analysis; and confirmatory factor analysis, which is dependent on the degree of knowledge about the structure of factors. Exploratory factor analysis is done to find the structure of factors when there is little knowledge about this structure. But confirmatory factor analysis, which can be conducted by the structural equation modeling method, is done to identify the underlying structures of factors which are established on the basis of *a priori* theories or empirical research. In this research, exploratory factor analysis was conducted.

The dimensionality of each of the five items, which consisted of attitudes to farming, farm entry policy, competitiveness policy, rural development policy, and farm entry barriers, was

analyzed by principal components factor analysis. The criterion of Eigenvalue-greater-than-1 was utilized to determine the number of factors to rotate, and factors were rotated using a Varimax rotation procedure. Generally, a factor loading of .3 is regarded as salient, a factor loading of .4 is significant, and a factor loading of .5 is regarded as an important variable (Hwang, 2006). Therefore, a factor loading of .3 or .4 is taken as the cut-off point (Hinton et al., 2004). In this research, variables which had factor loadings greater than .4 and communalities greater than .3 were retained as significant variables.

First, as a result of exploratory factor analysis for the five items used to measure attitudes to farming, the rotated solution yielded one factor, which was labeled ‘attractiveness of farming’. Factor loadings were from .722 to .797 and communalities were from .522 to .635, and these are presented in Table A.9 in Appendix A. These five items accounted for 57.9% of the item variance.

Second, as a result of exploratory factor analysis for the five items used to measure attitudes to farm entry policy, the rotated solution yielded one factor, which was labeled ‘effectiveness of farm entry policy’. Factor loadings were from .783 to .858 and communalities from .614 to .737, which is seen in Table A.10 in Appendix A. These five items accounted for 66.2% of the item variance.

Third, as a result of exploratory factor analysis for the five items to measure attitudes to competitiveness policy, the rotated solution yielded one factor, which was labeled ‘effectiveness of competitiveness policy’. Factor loadings were from .790 to .871 and communalities from .624 to .759, which is seen in Table A.11 in Appendix A. These five items accounted for 69.9% of the item variance.

Fourth, as a result of exploratory factor analysis for the five items used to measure attitudes to rural development policy, the rotated solution yielded one factor, which was labeled ‘effectiveness of rural development policy’. Factor loadings were from .768 to .848 and communalities from .590 to .719, which is seen in Table A.12 in Appendix A. These five items accounted for 66.0% of the item variance.

Finally, exploratory factor analysis for the five items used to measure attitudes to farm entry barriers was conducted. As a result, the rotated solution yielded one factor, which was labeled ‘ease of farm entry barrier elimination’. Factor loadings were from .544 to .775 and communalities were from .296 to .600, which is seen in Table A.13 in Appendix A. The communality of one item was not greater than .3; but it was not excluded from the list because the five items were made to measure the same concepts. These five items accounted for 42.7% of the item variance.

7.2.3.3 Open-ended interview data

Questions and responses

Group or individual interviews were carried out to get qualitative information such as why prospective farmers decided to, or decided not to, enter farming. This kind of information helped me comprehend the mechanism of the relationship between the characteristics of prospective farmers, agricultural structural adjustment policy, and farm entry. I asked about 30 students in six schools who responded to the questionnaire survey and were happy to participate in the interviews during the survey, which was carried out between 23 February, 2009 and 5 March, 2009. Questions and responses are as follows. Responses are represented randomly.

Question 1	***Why did you choose this agricultural school?***
Respondent 1A	*I did not select this agricultural high school to prepare to be a farmer. (High school student)*
Respondent 1B	*This school is nearest to my home. There are few schools which I can select. (High school student)*
Respondent 1C	*In fact, I am not interested in learning farming skills at this school. My friends at this school probably feel much the same. (High school student)*
Respondent 1D	*My purpose is to go on to a university. Students who attend schools which are located in rural areas receive preferential treatment when applying to a university. (High school student)*
Respondent 1E	*Many of the students who go to agricultural high schools have not got high enough scores in the national scholastic achievement test to go to academic high schools. Presumably, this is the main reason for entering agricultural high school. (High school teacher)*
Respondent 1F	*I enrolled at this college to learn higher farming skills. And this college is thought to give those who attend access to a network of people, including other alumni and professors, who could act as important resources to help them become successful farmers. (College student)*
Respondent 1G	*I think people have to graduate from university to be successful farmers, and this is one reason why I decided to enter this college. (College student)*
Respondent 1H	*In this college, I can learn all the things, like farming skills, management, marketing skills and so on which are needed to do farming. (College student)*
Respondent 1I	*It seems that exemption from military service is another motive for selecting this college. If a prospective farmer is selected as a successor*

farmer, this person can be exempted from military service. (College student)

Respondent 1J *Students have to be engaged in farming for six years after graduation. They can also get a non-farm job if they want. But nearly 100% of students are engaged in farming after graduation, because only people who have decided to be farmers come to this college, unlike agricultural high schools. (Professor at the college)*

The first question was asked to investigate whether the students chose agricultural school to prepare for a farming career or not. It seems that many agricultural high school students do not go to these schools to prepare to be farmers. Rather, they seem to consider agricultural schools as a college-preparatory course; or they have no choice but to go to an agricultural high school due to the convenience of attending such a school; or there is a shortage of schools which they could select; or they have low national scholastic achievement test scores. But agricultural college students seem to attend their colleges to prepare to be farmers. And they also seem to pursue multiple purposes, like learning farming skills, gaining access to a network of useful people, getting a certificate, and being exempted from military service. To sum up, education in agricultural schools is not likely to be as effective in encouraging prospective farmers to become engaged in farming as education in agricultural colleges.

Question 2 ***Do agricultural structural adjustment policies, like farm entry policy, competitiveness policy, and rural development policy, encourage you to do farming?***

Respondent 2A *I am indifferent to agricultural structural adjustment policy. Nor do I know exactly how the policy will relate to me after graduation. (High school student)*

Respondent 2B *Farm entry policy, like the successor farmers set-up program and the farming internship program, is introduced by teachers. But I am not interested in applying for those programs. (High school student)*

Respondent 2C *Agricultural structural adjustment policy is not a concern for people like me who do not want to do farming even though it may be attractive. (High school student)*

Respondent 2D *I shall not be dependent on agricultural policy. But I am interested in agricultural bio-technology and I hope the government will help apply this kind of technology to farming. (High school student and college student)*

Respondent 2E *I am very interested in farm entry policy. I hope the government will help prospective farmers become engaged in farming so they don't have to worry about funds. (College student)*

Respondent 2F *I am interested in agricultural structural adjustment policy, but it does not directly affect me. Rather it means that I could apply for programs related to it in a few years' time. (College student)*

Respondent 2G *Of the agricultural structural adjustment policies, I am interested in rural development policy. I think that the educational and cultural infrastructure must be improved to attract young people to rural areas. (College student)*

The second question was asked to investigate how prospective farmers were affected by agricultural structural adjustment policy. It seems that agricultural structural adjustment policy does not directly affect young people who are not interested in doing farming after graduation. Some students were even indifferent to agricultural structural adjustment policy. But this policy and its related policies could affect young people, mainly college students, who are interested in doing farming after graduation by giving them financial incentives or by

developing the rural areas they will live in. This indicates that agricultural structural adjustment policy is not likely to be so effective as to make young people who are not interested in farming do farming after graduation. But it seems that it could strengthen the intention to enter farming of some people who are potentially interested in farming after graduation.

Question 3	***If you have decided to do, or not to do, farming after graduation, what is the reason?***
Respondent 3A	*I definitely do not want to be a farmer. The hard physical working conditions and the underdevelopment of rural areas put me off. I will leave here when I graduate from this school. I think this may also be the case with my friends. (High school student)*
Respondent 3B	*Who do you think wants to be a farmer? It would be strange to want to be engaged in farming, given the circumstances. I think any kind of non-farm job is better than farming. (High school student)*
Respondent 3C	*My parents do not want me to do farming. I want to get a non-farm job in an urban area. (High school student)*
Respondent 3D	*It seems that fewer than five out of every 100 students become engaged in farming annually. Further, nobody seems to intend to engage in traditional farming, which requires hard physical work. This is a serious problem. (High school teacher)*
Respondent 3E	*I think high school students are not mature enough to determine their future jobs yet. And they may think that they can get the non-farm jobs which they hope for after graduation. Therefore, they will not consider farming as an alternative., (High school teacher)*
Respondent 3F	*I will engage in farming after graduation. My parents do farming on a large scale. And I also think farming could be an attractive job for the*

future. (High school student)

Respondent 3G *I majored in mechanics in high school and was employed at a small factory for some years. But I thought farming had better prospects than this kind of work, due to the possibility of food supply problems in the future. (College student)*

Respondent 3H *My parents raise pigs on a large scale and they want me to help them. I also think farming is the best choice for me. Actually, I do not dislike farming because I have had experience of it from a young age. (College student)*

Respondent 3I *There are many farmers who operate large-scale farms and earn big money. And farming is different from what it was a few decades ago. It is not a labor-intensive hard job any more. And I believe that if I do my best at farming, I can be a successful farmer like my parents. (College student)*

Respondent 3J *My dream is to be a rich and successful farmer. This can be realized by applying new farming skills to traditional farming. Therefore, farming could be a very decent job. (College student)*

Respondent 3K *I like farming. I like a green fields and livestock. (College student)*

The last question asked looked at why prospective farmers who attended agricultural schools did or did not intend to engage in farming after graduation. It seems that factors which deter young people from farming are poor agricultural circumstances like hard physical working conditions, underdevelopment of rural areas, and prejudices against farming arising from those aspects of the farming life. But, a tradition of succession in the family business of a large scale farm household, the expectation of being a successful farmer, and better prospects for farming in the future seem to be motives for doing farming.

Conclusion

The main objective of these interviews was to estimate the likelihood of prospective farmers becoming engaged in farming after graduation and the role of agricultural structural adjustment policy in this. It seems that agricultural schools, especially agricultural high schools, may not be a path to farming for prospective farmers. And many prospective farmers are not likely to opt to become engaged in farming, due to disadvantageous aspects of farming like low income, hard physical working conditions, and the underdevelopment of rural areas, although better prospects for farming in the future than exist at present make some people want to do farming. And agricultural structural adjustment policy, which includes education in schools and measures for agricultural and rural area development, seems not to offset those disadvantageous aspects and not to affect prospective farmers unless they really are potential farmers.

7.2.4 Verification of hypotheses

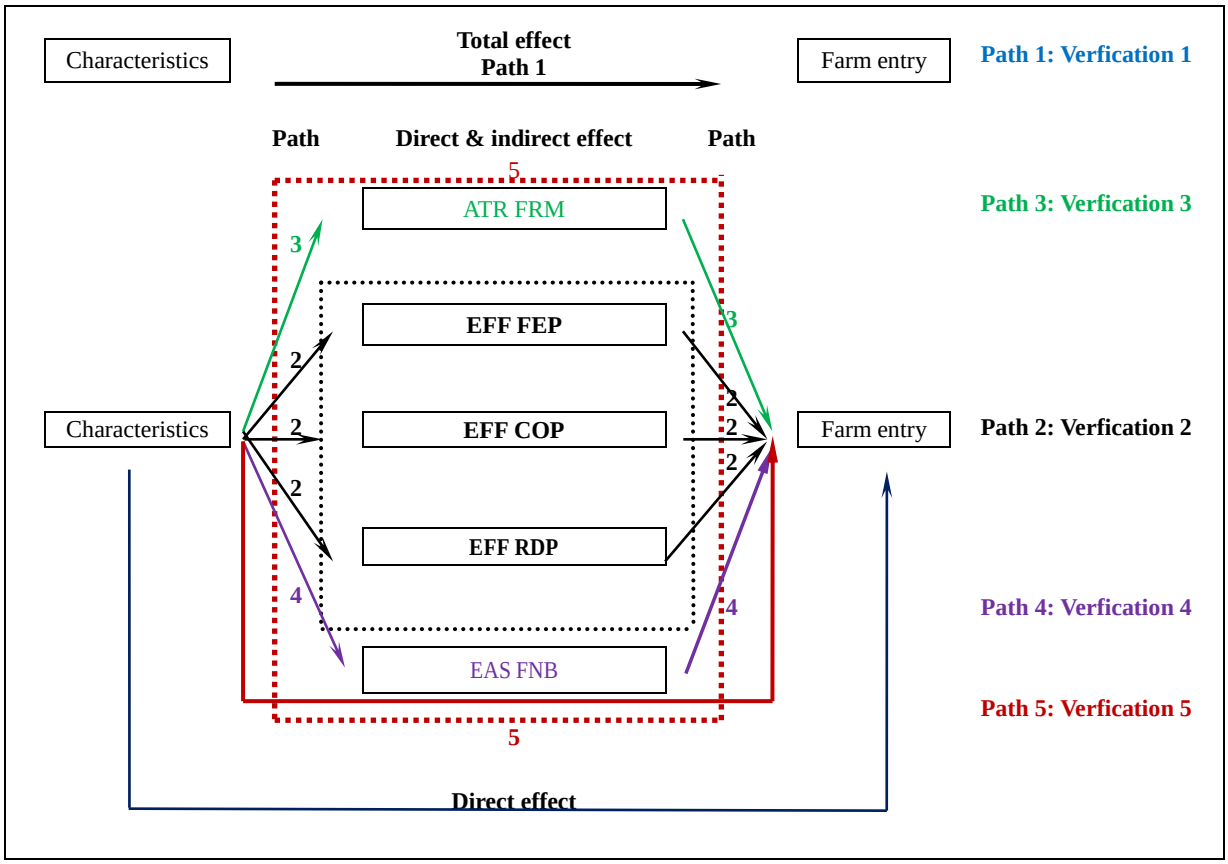
7.2.4.1 Verification procedures

This research investigates whether the personal characteristics of prospective farmers (independent variables) directly or indirectly affect farm entry (dependent variable) through the attractiveness of farming (ATR FRM), the effectiveness of farm entry policy (EFF FEP), the effectiveness of competitiveness policy (EFF COP), the effectiveness of rural development policy (EFF RDP), and the ease with which farm entry barriers can be eliminated (EAS FNB, mediators), in order to verify the research hypotheses (Section 6.3.2), which can be represented as in Figure 7.1 below.

The investigation outlined above is conducted in two steps. First, the question of whether the

personal characteristics of prospective farmers affect farm entry is verified, in order to find significant variables for farm entry. Then, the question of whether the personal characteristics of prospective farmers affect farm entry directly or indirectly through the mediators is verified by setting personal characteristics which have been proven to affect farm entry in the first ste as independent variables.

Figure 7.1 Total, direct, and indirect effect model for farm entry



* Note: ATR FRM (Attractiveness of farming), EFF EFP (Effectiveness of farm entry policy) EFF COP (Effectiveness of competitiveness policy), EFF RDP (Effectiveness of rural development policy), EAS FNB (Ease of farm entry barrier elimination)

The five hypotheses, which are shown in Section 6.3.2.1, are verified as follows. First, Hypothesis 1 is verified by analyzing the total effect of the personal characteristics of prospective farmers on farm entry in Path 1. Second, Hypothesis 2 is verified by analyzing the indirect effects of the personal characteristics of prospective farmers on farm entry through

farm entry policy (EFF FEP), competitiveness policy (EFF COP), and rural development policy (EFF RDP) in Path 2. Third, Hypothesis 3 is verified by analyzing the indirect effects of the personal characteristics of prospective farmers on farm entry through farming conditions (ATR FRM) in Path 3. Fourth, Hypothesis 4 is verified by analyzing the indirect effects of the personal characteristics of prospective farmers on farm entry through farm entry barriers (EAS FNB) in Path 4. Finally, Hypothesis 5 is verified by analyzing the indirect effects of the personal characteristics of prospective farmers on farm entry through farming conditions (ATR FRM), farm entry policy (EFF FEP), and farm entry barriers (EAS FNB) in Path 5.

7.2.4.2 Hypothesis 1

Binary logistic regression analysis was conducted to verify whether the personal characteristics of prospective farmers were associated with farm entry. The predictors were 27 dummy variables[6] which represented 12 categorical variables like grade of schooling, sex, ranking amongst siblings, birth place, farming experience, major subject taken at school, number of siblings, farming produce, location of farming, type, and kinds of farm entry barriers, and the criterion variable was farm entry.

The results showed that the model was statistically significant, $\chi^2(27, N = 345) = 276.11$, $p = .000$ compared to the model with only intercept. The model explained between 55.1% (Cox and Snell R square) and 79.8% (Nagelkerke R square) of the variance of farm entry, and it

[6]'non farming' is a dummy variable for both farming location and farming produce by parents. If 'non farming' is not dummy coded for both categorical variables, 191 subjects (55%) whose parents do not do farming will be removed from the regression analyses due to lack of data, and the remaining cases could not represent the population. By binary logistics regression analysis, dummy coded 'non farming' for farming location was removed from the analysis due to redundancy between the two variables. And multicollinearity was checked by using VIF and the cut-off value of VIF was 5 (Hutcheson and Sofroniou, 1999; Menard, 1995). The values of VIF ranged from 1.105 to 4.185 and therefore, all the 27 independent variables were included in the analysis.

correctly classified 97.2% of the prospective farmers who did enter farming and 84.0% of the prospective farmers who did not enter farming or had not decided on their job, with an overall success rate of 93.6% in the classification.

Table A.15 in Appendix A shows B coefficients, Wald $\chi 2$, significance values, and Exp (b) by predictors, and the results can be interpreted as follows.

First, when school grade is dummy coded into 'first grade' and 'second grade', by setting 'third grade' as the reference group, there is no significant difference in farm entry between the first grade and the third grade (β=-.711, Wald $\chi 2$=.344, p=.558) of school, or between the second grade and the third grade (β=.083, Wald $\chi 2$=.015, p=.902). This indicates that grade does not affect farm entry. It implies that receiving an education in farming skills in an agricultural school does not facilitate the farm entry of prospective farmers, in that the higher grade does not have a higher probability of farm entry.

Second, when sex is dummy coded into 'male', by setting 'female' as the reference group, male is not more likely to do farming than female (β=-.063, Wald $\chi 2$=.012, p=.914). This means that sex does not affect farm entry.

Third, when sibling ranking is dummy coded into 'the oldest', by setting the others as the reference group, the oldest children are not more likely to do farming (β=-.529, Wald $\chi 2$=1.107, p=.293) than the reference group, which provides evidence that the phenomenon of primogeniture is not prevalent in farm households in Korea.

Fourth, when birth place is dummy coded into 'city', by setting 'county' as the reference group, there is no significant difference between them (β=.742, Wald $\chi 2$=1.910, p=.167). This means that birth place does not affect farm entry.

Fifth, when farming experience is dummy coded into ‘experienced’, by setting ‘not experienced’ as the reference group, prospective farmers who have experienced farming are not more likely to do farming than those who have not experienced farming (β=.092, Wald χ2=.019, p=.890). That is, farm experience does not affect farm entry.

Sixth, when prospective farmers’ major subject in school is dummy coded into ‘crop farming’, ‘livestock farming’, ‘landscape architecture’, and ‘food processing and other produces’, by setting ‘horticulture’ as the reference group, there is no significant difference in farm entry between crop farming and horticulture (β=.537, Wald χ2=.059, p=.808), between livestock farming and horticulture (β=.504, Wald χ2=.269, p=.604), between landscape architecture and horticulture (β=.571, Wald χ2=.391, p=.532), or between food processing and other produces and horticulture (β=1.098, Wald χ2=1.971, p=.160). This indicates that prospective farmers’ major subjects do not affect farm entry.

Seventh, when parents’ jobs are dummy coded into ‘farming’, by setting ‘non-farm jobs’ as the reference group, there is no significant difference in farm entry between the two groups (β=1.130, Wald χ2=2.489, p=.115). That is, prospective farmers whose parents do farming are not more likely to enter farming than those whose parents are not engaged in farming.

Eighth, when the number of sibling is dummy coded into ‘zero people’, ‘one person’, ‘two people’, and ‘three people’, by setting ‘four people or more’ as the reference group, only prospective farmers who have two sibling are less likely to do farming than those who have four or more siblings (β=-2.522, Wald χ2=8.006, p=.005, odd ratio=.080) and the inverted odd ratio (1/.080=12.5) indicates that the latter are 12.5 times more likely to do farming than the former. But there are no significant differences between zero people and four or more people (β=.957, Wald χ2=.851, p=.356), between one person and four or more people (β=.928, Wald

$\chi 2$=1.168, p=.280), or between three people and four or more people (β=-.581, Wald $\chi 2$=.404, p=.525). This result is evidence that prospective farmers who have more siblings are not always more likely to do farming.

Ninth, when farm location is dummy coded into 'county' by setting 'city' as the reference group, dummy coded 'county' is proved to be a significant predictor of farm entry (β=-3.097, Wald $\chi 2$=10.815, p=.001, Odds ratio=.045). The inverted odds ratio indicates that prospective farmers whose parents do farming in a city area are about 22.2 times more likely to be engaged in farming after graduation than those whose parents do farming in a country area. From this, it can be estimated that prospective farmers are more likely to do farming in more populated and developed areas, because they feel that rural areas have less favorable living conditions, educational provision, and cultural infrastructure than urban areas (Kang, 2004; Personal communications, from February 23 to March 5, 2009).

Tenth, when the type of farming done by parents is dummy coded into 'livestock', 'crops and livestock', 'horticulture, landscape and other produces', and 'non farming' by setting crops as the reference group, there are no significant differences in farm entry between crops and livestock and crops (β=.800, Wald $\chi 2$=.695, p=.404), or between horticulture, landscape and other produces and crops (β=1.160, Wald $\chi 2$=.735, p=.391). But, prospective farmers whose parents raise livestock are about 36 times more likely to do farming than those whose parents cultivate crops (β=3.591, Wald $\chi 2$=16.934, p=.000, Odds ratio=36.270), and prospective farmers whose parents cultivate crops are about 31 time more likely to do farming than those whose parents do not farm (β=-3.445, Wald $\chi 2$=11.965, p=.001, Odds ratio=.032). This result means that the type of produce farmed by prospective farmers' parents conditionally affects farm entry.

Eleventh, when farm entry barriers are dummy coded into ‘faming skills’, ‘funds’, ‘social status of farmers’, ‘living conditions in rural areas’, and ‘others’, by setting ‘low farming income’ as a reference group, there are no significant differences between farming skills and low farming income (β=.768, Wald $\chi2$=.889, p=.346), between funds and low farming income (β=-.604, Wald $\chi2$=.659, p=.417), between social status and low farming income (β=-1.117, Wald $\chi2$=1.646, p=.200), or between living conditions and low farming income (β=.143, Wald $\chi2$=.034, p=.854). But, there is significant difference between others and low farming income (β=-5.625, Wald $\chi2$=4.505, p=.034). This means that farm entry barriers conditionally affect farm entry.

Finally, when type is dummy coded into ‘farming preference type’ and ‘risk averse type’, by setting ‘non-farm job preference type’ as the reference group, the model shows that prospective farmers of the farming preference type are 17.6 times more likely to do farming after graduation than those in the non-farm job preference type (β=2.867, Wald $\chi2$=13.007, p=.000, Odds ratio=17.586). However, there is no significant difference between the risk averse type and the non-farm job preference type (β=.853, Wald $\chi2$=1.421, p=.233). It is thought that farming is regarded as inferior to non-farm jobs by risk averse types, which makes risk averse types similar to non-farm job preference types. This result supports the theory that only prospective farmers who have an interest in farming, like those in the farming preference type, are more likely to do farming (Rossier and Wyss, 2006) than other groups.

In conclusion, the location of their parents’ farm (county) affects prospective farmers’ farm entry. And the number of sibling (two people), farming produce (livestock), type (farming preference type), and kinds of farm entry barriers (others) conditionally affect farm entry. But birth place as well as grade in school, sex, sibling ranking, farming experience, major subject

in school, and parents' jobs do not affect farm entry. Therefore, the null hypothesis H01 is rejected, which means that agricultural structural adjustment policy, which is intended to make prospective farmers who are born in rural areas stay in farming, is not effective, because prospective farmers who are born in rural areas are not more likely to engage in farming than those who are born in urban areas.

On the basis of the above results, farm location (COUNTY) and type (FARMING PREFERENCE TYPE) are the only items that can be entered as independent variables in the model to verify whether personal characteristics of prospective famers indirectly affect farm entry through five mediators. The number of sibling (two), farming produce (livestock), and farm entry barriers (others) were excluded from the group of independent variables because these conditionally affect farm entry.

7.2.4.3 Hypothesis 2

In this section, whether farm entry policy or competitiveness policy or rural development policy mediates the relationship between personal characteristics and farm entry, and whether or not there is offset between the mediation effects of farm entry policy, competitiveness policy, and rural development policy is verified. Three mediation effect analyses of farm entry policy, competitiveness policy, and rural development policy are conducted, and then, whether or not there is offset between them is verified using Hayes' macro (2009).

Verification of the mediation effect of the effectiveness of farm entry policy (EFF FEP) between the personal characteristics of prospective farmers and farm entry

A multiple mediation effect analysis was conducted to verify whether EFF FEP mediates between the personal characteristics of prospective farmers like COUNTY and FARMING

PREFERENCE TYPE and farm entry.

First, COUNTY is entered as the independent variable, EFF FEP is entered as the mediator, and farm entry is entered as the dependent variable. As a result, COUNTY is directly associated with farm entry (β=-1.6461, Z=-3.48, p=.0005). And the bootstrap result for the indirect effect of COUNTY indicates that EFF FEP mediates the effect of COUNTY on farm entry, with a point estimate of -.3722 and 95% bias-corrected and accelerated bootstrap confidence interval (95% BCa CI) of -.8237 to -.0266[7]. The indirect effect is still significant when the other four mediators are simultaneously entered in the model[8], with a point estimate of -.2513 and 95% BCa CI of -.7304 to -.0087. These results indicate that EFF FEP partially mediates between COUNTY and farm entry.

Second, FARMING PREFERENCE TYPE is entered as the independent variable, and the mediator and the dependent variable are the same as above. As a result, FARMING PREFERENCE TYPE is directly associated with farm entry (β=3.006, Z=5.86, p=.0000). And the bootstrap result for indirect effect indicates that farming preference is indirectly associated with farm entry through EFF FEP, with a point estimate of .6058 and 95% BCa CI of .2375 to 1.1446. And, when all the five mediators are simultaneously entered in the model, FARMING PREFERENCE TYPE is still indirectly associated with farm entry through EFF FEP, with a point estimate of .4090 and 95% BCa CI of .0173 to .9832. These indicate that EFF FEP also partially mediates between FARMING PREFERENCE TYPE and farm entry.

The above results can be summarized as follows. EFF FEP partially mediates between

[7] If the confidence interval includes zero, there is evidence that the third variable effect is not larger than expected by chance (Mackinnon et al, 2000, p.177~178)'.

[8] Multicollinearity among these mediators was checked using VIF and cut-off point was 10 (Field, 2009). As a result, values of VIF ranged from 1.403 to 2.852.

COUNTY and farm entry and between FARMING PREFERENCE TYPE and farm entry. In particular, prospective farmers whose parents do farming in the COUNTRY are less likely to do farming, which is partly because they feel farm entry policy is less effective (β=-.3882, t=-2.38, p=.0175), which in turn gives them a lower probability of farm entry (β=.6472, Z=2.08, p=.0368). And EFF FEP also partially mediates between FARMING PREFERENCE TYPE and farm entry. Prospective farmers who belong to the FARMING PREFERENCE TYPE have a higher probability of doing farming than those who belong to the non-farm job preference type, which is partly due to the fact that the former finds farm entry policy more effective (β=.6319, t=4.16, p=.0000) than the latter does, which in turn leads to a higher probability of farm entry (β=.6472, Z=-2.09, p=.0368). These results indicate that farm entry policy does make a significant difference to farm entry between prospective farmers.

Verification of the mediation effect of the effectiveness of competitiveness policy (EFF COP) between the personal characteristics of prospective farmers and farm entry

A multiple mediation effect analysis was conducted to verify whether EFF COP mediates between the personal characteristics of prospective farmers and farm entry.

First, COUNTY is entered as the independent variable, and EFF COP and farm entry are entered as the mediator and the dependent variable in the model. The result indicates that the direct effect of COUNTY on farm entry is significant (β=-1.6223, Z=-3.47, p=.0005). The bootstrap result for indirect effect reveals that the indirect effect of COUNTY on farm entry through EFF COP is also significant, with a point estimate of -.2874 and 95% BCa CI of -.7054, -.0417. But the indirect effect of COUNTY on farm entry through EFF COP becomes insignificant with a point estimate of .0307 and 95% BCa CI of -.2607 to .4156 when the other four mediators (FEE FEP, EFF RDP, ATR FRM, and EAS FNB) are included in the

model. This is because EFF COP is not significantly associated with farm entry any more (β=-.0739, Z=-.23, p=. 8215). Finally, EFF COP does not mediate between COUNTY and farm entry.

Second, FARMING PREFERENCE TYPE is entered as the independent variable, and the mediator and dependent variable are the same as above. The result indicates that FARMING PREFERENCE TYPE is significantly associated with farm entry (β=2.6615, Z=5.15, p=.0000) and is also indirectly associated with farm entry through EFF COP, with a point estimate of .5566 and 95% BCa CI of .2053 to 1.0311. The indirect effect of FARMING PREFERENCE TYPE on farm entry through EFF COP is insignificant, with a point estimate of -.0595 and 95% BCa CI of -.7075 to .4720, when the other mediators are simultaneously entered in the model, which is because EFF COP is not significantly associated with farm entry any more (β=-.0739, Z=-.23, p=.8215). This shows that EFF COP does not mediate between FARMING PREFERENCE TYPE and farm entry.

In conclusion, EFF COP does not mediate between COUNTY and farm entry or between FARMING PREFERENCE TYPE and farm entry. This means that although prospective farmers whose parents do farming in the COUNTY have a lower probability of farm entry than the reference group, and prospective farmers who belong to FARMING PREFERENCE TYPE have higher probability of farm entry than the reference group, there is no evidence that competitiveness policy makes a significant difference to their farm entry.

Verification of the mediation effect of the effectiveness of rural development policy (EFF RDP) between the personal characteristics of prospective farmers and farm entry

A multiple mediation effect analysis was conducted to verify whether EFF RDP mediates

between the personal characteristics of prospective farmers and farm entry.

First, the independent variable is COUNTY, the mediator is EFF RDP, and the dependent variable is farm entry. The result shows that COUNTY is significantly associated with farm entry (β=-1.6709, Z=-3.53, p=.0004) and the bootstrap result for indirect effect shows that it is also indirectly associated with farm entry with a point estimate of -.3146 and a 95% BCa CI of -.7366 to -.0528. COUNTY is not indirectly associated with farm entry through EFF RDP any more, with a point estimate of -.1361 and 95% BCa CI of -.5939 to .1160, when the other four mediators are included in the model. This means that EFF RDP does not mediate between COUNTY and farm entry.

Second, the independent variable is FARMING PREFERENCE TYPE, and the mediator and dependent variable are the same as above. The result shows that FARMING PREFERENCE TYPE is directly associated with farm entry (β=2.8870, Z=5.64, p=.0000) and it is also indirectly associated with farm entry, with a point estimate of .3828 and 95% BCa CI of .1129 to .8049. But when all the five mediators are simultaneously entered in the model, a bootstrap result for indirect effect indicates that FARMING PREFERENCE TYPE is not significantly associated with farm entry through EFF RDP, with a point estimate of .1656 and 95% BCa CI of –.1732 to .6007, which is because EFF RDP is not associated with farm entry (β=.3128, Z=1.06, p=.2881). This means that EFF RDP does not mediate between FARMING PREFERENCE TYPE and farm entry.

In conclusion, EFF RDP does not mediate between COUNTY and farm entry or between FARMING PREFERENCE TYPE and farm entry. This is because EFF RDP is not associated with farm entry, even though COUNTY and FARMING PREFERENCE TYPE are significantly associated with EFF RDP. These indicate that rural development policy does not

make a significant difference to their farm entry.

Verification of offset among the mediation effects of farm entry policy (EFF FEP), competitiveness policy (EFF COP), and rural development policy (EFF RDP)

Offset among mediation effects is determined by whether or not there is a suppressor between them. A suppressor is a variable which makes the relationship between two variables spurious (Rosenberg, 1968) when it is not controlled.

In a single mediation model, a suppressor increases the beta coefficient of an independent variable when it is included in the model as the mediator (Conger, 1974). This takes place in the case where the signs of a regression coefficient between direct effect and indirect effect are opposite. In this case, the total effect could become insignificant, or near to zero (Mackinnon and Krull et al., 2000), as in the definition of Rosenberg (1968), if the mediator is not controlled.

Meanwhile, in a multiple mediation model, the suppression effect is defined by the signs between the mediators (Mackinnon, 2008; Preacher and Hayes, 2008). When the effects of one set of mediators are canceled out by the effects of other mediators which have opposite signs[9], the latter has a suppression effect. And in this case, the indirect effect decreased, but the direct effect increased, to the country. In this research, the suppression effect, offset between mediators, is verified by comparing the signs of mediation effects between mediators, following the concept of Preacher and Hayes (2008).

It is necessary to make clear which of the mediators act as suppressors in a multiple mediation

[9] "Inconsistent mediation is more common in multiple mediator models where mediated effects have different signs" (Mackinnon, 2009; pp.602-603)

model before verifying the suppression effect, that is, the offset. Theoretically, there is no way to differentiate suppressors from mediators. Therefore, a model that is intended to verify the suppression effect must be dependent on *a priori* assumptions about the role of the suppressors (Mackinnon and Krull et al., 2000).

Agricultural structural adjustment policy is intended to directly encourage prospective farmers to do farming (MAF, 2004) by providing them with incentives or showing them better prospects for farming than they could have expected in the past. But it is possible that competitiveness policy or rural development policy are discouraging them from doing farming in unforeseen ways. For example, some programs which are part of competitiveness policy, like farmland amalgamation, could hinder prospective farmers from entering farming by supporting larger scale farmers rather than beginner farmers. And it is also possible that rural development policy could discourage them from doing farming by inducing them to take non-farm jobs which the policy is creating in rural areas. For example, promotion of rural tourism creates non-farm job opportunities and rural young people can try to get these jobs instead of farming. In this research, farm entry policy is regarded as the mediator, and competitiveness policy and rural development policy are regarded as the potential suppressors.

A multiple mediation effect analysis was conducted to verify whether competitiveness policy or rural development policy offsets the mediation effect of farm entry policy.

First, the independent variable is COUNTY, the mediators are EFF FEP, EFF COP, and EFF RDP, and the dependent variable is farm entry. As a result, COUNTY is directly (β=-1.5657, Z=-3.26, p=.0011) and indirectly (a point estimate of -.4546 and 95% BCa CI of -.9888 to -.0335) associated with farm entry. When comparing specific mediation effects by mediators, EFF FEP (a point estimate of -.2882 and 95% BCa CI of -.7666 to -.0293), EFF COP (a point

estimate of -.0210 and 95% BCa CI of -.3603 to -.2666), and RDP (a point estimate of -.1454 and 95% BCa CI of -.5836 to .0941) have the same sign, indicating that EFF COP and EFF RDP do not offset the mediation effect of farm entry policy. But when the other two mediators are controlled in the model, the sign of the mediation effect of EFF COP turns positive (a point estimated of .0307, 95% BCa CI of -.2607 to .4156), which indicates that EFF COP offsets the mediation effect of farm entry policy.

Second, the independent variable is FARMING PREFERENCE TYPE, and the dependent variable and mediators are the same as above. As a result, FARMING PREFERENCE TYPE is directly (β=2.7537, Z=5.16, p=.0000) and indirectly (a point estimate of .6866, 95% BCa CI of .1851 to 1.3421) associated with farm entry through the mediators. And the specific mediation effect of EFF FEP (a point estimate of .4691 and 95% BCa CI of .1059 to 1.0394), EFF COP (a point estimate of .0406 and 95% BCa CI of -.5216 to 5396), and EFF RDP (a point estimate of .1770 and 95% BCa CI of -.1339 to .5979) are all positive, which indicates that EFF COP and EFF RDP do not offset the mediation effect of farm entry policy. But when the other two mediators are controlled in the model, the mediation effect of EFF COP turns negative (a point estimated of -.0595, 95% BCa CI of -.7075 to .4720), indicating that it offsets the mediation effect of farm entry policy.

In conclusion, although EFF COP and EFF RDP do not suppress the mediation effects of COUNTY and FARMING PREFERENCE TYPE on farm entry when the other mediators are not controlled, EFF COP suppresses the mediation effect of farm entry policy on farm entry when the other two mediators are controlled. This indicates that there is offset between farm entry policy and competitiveness policy.

Results of verification of Hypothesis 2

The above four verifications show that only farm entry policy makes a significant difference to the farm entry of prospective farmers[10], and there is offset between the mediation effects of farm entry policy and competitiveness policy. Therefore, null hypothesis H02 is rejected.

7.2.4.4 Hypothesis 3

A multiple mediation effect analysis was conducted by adopting Hayes' macro (2009) to verify whether the attractiveness of faming (ATR FRM) mediates between the characteristics of prospective farmers and farm entry.

First, COUNTY is entered as the independent variable, and ATR FRM and farm entry are entered as the mediator and dependent variable. As a result, COUNTY is directly associated with farm entry (β=-1.84, Z=-3.89, p=.0001). But the result of bootstrapping for the indirect effect of COUNTRY indicates that COUNTY is not indirectly associated with farm entry through ATR FRM, with a point estimate of -.1734 and 95% BCa CI of -.5340 to .0632. This means that ATR FRM does not mediate between COUNTY and farm entry, because there is no significant difference in ATR FRM between the two groups (β=-.2753, t=-1.67, p=.0949) although ATR FRM and farm entry are in a positive relationship (β=.6299, t=3.38, p=.0007). Accordingly, although prospective farmers whose parents do farming in a COUNTY area are less likely to do farming than the reference group, there is no possibility that ATR FRM affects this.

Second, FARMING PREFERENCE TYPE is entered as the independent variable, and the

[10] In this study, the measures of attitudes toward farm entry policy (i.e. whether farm entry policy facilitates farm entry or not) and behavior (i.e. whether farm entry takes place or not) involve the same action, target, context, and time elements. But the measure of attitudes toward the competitiveness policy or attitudes toward the rural development policy does not involve the same action or target as the measure of the behavior. It is because the competitiveness policy and the rural development policy are not established to directly facilitate farm entry. Thus, it can be inferred that the competitiveness policy or the rural development policy is not significantly associated with farm entry.

mediator and dependent variable are the same as above. As a result, FARMING PREFERENCE TYPE is directly associated with farm entry (β=3.0006, Z=5.86, p=.0000). And the result of a bootstrap analysis for the indirect effect indicates that ATR FRM mediates the relationship between FARMING PREFERENCE TYPE and farm entry, with a point of estimate of .6058 and 95% BCa CI of .2375 to 1.1446. This indicates that FARMING PREFERENCE TYPE farmers find farming more attractive than the non-farm job preference type (β=.3856, Z=2.50, p=.0126) and therefore they are more likely to be engaged in farming. However, the mediation effect becomes insignificant when the other four mediators are simultaneously entered in the model, with a point estimate of .0175 and 95% of BCa CI of -.1941 to .3041, which is because the relationship between ATR FRM and farm entry turns insignificant (β=.0455, Z=.18, p=.8541). This indicates that ATR FRM does not mediate between FARMING PREFERENCE TYPE and farm entry.

In conclusion, ATR FRM does not mediate the relationship between COUNTY and farm entry or between FARMING PREFERENCE TYPE and farm entry. Therefore, null hypothesis H03 was adopted, and it can be concluded that farming conditions do not make a significant difference to farm entry between prospective farmers.

7.2.4.5 Hypothesis 4

A multiple mediation effect analysis was conducted to verify whether the ease with which farm entry barriers can be eliminated (EAS FNB) mediates between the personal characteristics of prospective farmers and farm entry.

First, COUNTY is entered as the independent variable, EAS FNB is entered as the mediator, and farm entry is entered as the dependent variable. As a result, COUNTY is directly

associated with farm entry (β=-1.7446, Z=-3.70, p=.0000) and it is also indirectly associated with farm entry through EAS FNB, with a point estimate of -.2493 and 95% BCa CI of -.5987 to -.0213. This means that EAS FNB partially mediates the relationship between COUNTY and farm entry. However, when the other four mediators are simultaneously entered in the model, the mediation effect of EAS FNB turns out to be insignificant with a point estimate of -.1428 and 95% BCa CI of -.5083 to .0221, which is because EAS FNB is not associated with farm entry (β=.4306, Z=1.67, p=.0938). This means that EAS FNB does not mediate between the two.

Second, FARMING PREFERENCE TYPE is entered as the independent variable, and the mediator and dependent variable are the same as above. As a result, FARMING PREFERENCE TYPE is directly associated with farm entry (β=2.91, Z=5.63, p=.0000) and the bootstrap result for indirect effect reveals that it is also indirectly associated with farm entry through EAS FNB, with a point estimate of .4071 and 95% BCa CI of .1242 to .8185. This means that EAS FNB partially mediates the relationship between FARMING PREFERENCE TYPE and farm entry. But when the other four mediators are simultaneously entered into the model, the indirect effect of EAS FNB becomes insignificant, with a point estimate of .2333 and 95% BCa CI of -.0456 to .6597. This is because the relationship between EAS FNB and farm entry is not significant any more (β=.4306, Z=1.67, p=.0938). This means that EAS FNB does not mediate between FARMING PREFERENCE TYPE and farm entry.

In conclusion, EAS FNB does not mediate between COUNTY and farm entry or between FARMING PREFERENCE TYPE and farm entry, which is because EAS FNB is not associated with farm entry, despite the fact that there is a significant difference in EAS FNB

between COUNTY and the reference group (β=-.3318, t=-2.09, p=.0371) and between FARMING PREFERENCE TYPE and the reference group (β=.5419, t=3.65, p=.0003).

So, why does EAS FNB not affect farm entry? It could be because farm entry barriers may not be a critical factor in determining whether prospective farmers enter farming or not. Prospective farmers may wish to engage in farming even if they feel that they cannot eliminate farm entry barriers. For example, even if prospective farmers think shortage of funds is a farm entry barrier, they can be engaged in farming by reducing the size of the farm they start with or delaying the point at which they enter farming. In this case, farm entry barriers and farm entry are not associated with each other.

Accordingly, null hypothesis H04 is adopted, and it can be concluded that a farm entry barrier does not make significant difference to the farm entry of prospective farmers.

7.2.4.6 Hypothesis 5

A multiple mediation effect analysis was conducted to verify whether there is offset among the mediation effects of ATR FRM, EFF FEP, and EAS FNB between the personal characteristics of prospective farmers and farm entry.

First, COUNTY is entered as the independent variable, ATR FRM, EFF FEP, and EAS FNB are entered as the mediators controlling EFF COP and FEE RDP, and farm entry is entered as the dependent variable. As a result, COUNTY is directly (β=-1.5304, Z=-3.10, p=.0019) and indirectly (with a point estimate of -.5120, 95% BCa CI of -1.0773 to -.0386) associated with farm entry, which means that the five mediators as a whole partially meditate between COUNTY and farm entry. Meanwhile, the signs of the mediation effects of ATR FRM, EFF FEP, and EAS FNB are negative, which means that farming conditions (ATR FRM) and farm

entry barriers (EAS FNB) do not offset the mediation effect of farm entry policy.

Second, FARMING PREFERENCE TYPE is entered as the independent variable, and the mediators and dependent variable are the same as above. As a result, FARMING PREFERENCE TYPE is directly associated with farm entry (β=2.7799, Z=5.09, p=.0000) and it is also indirectly associated with farm entry (a point estimate of .7659, 95% BCa CI of .1909 to 1.4357). The signs of the mediation effects of ATR FRM, EFF FEP, and EAS FNB are all positive, which means that farming conditions and farm entry barriers do not offset the mediation effect of farm entry policy.

In conclusion, the five mediators as a whole partially mediate the relationship between COUNTY and farm entry and between FARMING PREFERENCE TYPE and farm entry, and ATR FRM and EAS FNB do not offset the mediation effect of EFF FEP. Therefore, null hypothesis H05 was adopted, and it can be concluded that farming conditions and farm entry barriers do not cancel the effect of farm entry policy.

7.2.5 Summary and conclusions

The five hypotheses were verified to address the research question of why agricultural structural adjustment policy does not stop the trend towards a decrease in the number of young farmers. The results are summarized in Table 7.6.

First, a binary logistics regression analysis was conducted to verify whether the personal characteristic of birth place affects farm entry (Hypothesis 1). As a result, it was found that birth place is not associated with farm entry, although the other personal characteristics of number of siblings (two people), farming produce (livestock), location of parents' farm (COUNTY), type (FARMING PREFERENCE TYPE), and farm entry barriers (others) do

conditionally affect farm entry. Therefore, null hypothesis H01 was rejected, which means that that it is difficult for agricultural structural adjustment policy to induce young people who are born in rural areas to do farming, because rural young people are no more likely to do farming than urban young people.

Second, a multiple mediation effect analysis was conducted to verify whether farm entry policy (EFF FEP), competitiveness policy (EFF COP), and rural development policy (EFF RDP) mediate between the personal characteristics of prospective farmers and farm entry and whether there is offset between them (Hypothesis 2). As a result, it was found that only farm entry policy mediates the relationships between the characteristics of farmers and farm entry. And competitiveness policy cancelled the effect of farm entry policy. Therefore, null hypothesis H02 was rejected, which means that although farm entry policy does make a significant difference to the farm entry of prospective farmers, competitiveness policy reduces the effect of farm entry policy.

Third, a multiple mediation effect analysis was conducted to verify whether attitudes to farming (ATR FRM) mediate between personal characteristics and farm entry (Hypothesis 3). The result indicated that ATR FRM does not mediate the relationship between COUNTY and farm entry or between FARMING PREFERENCE TYPE and farm entry. Therefore, null hypothesis H03 was adopted, which means that farming conditions do not make a significant difference to the farm entry of prospective farmers.

Fourth, a multiple mediation effect analysis was conducted to verify whether farm entry barriers (EAS FNB) mediate the relationship between personal characteristics and farm entry (Hypothesis 4). As a result, it was proven that EAS FNB does not mediate between COUNTY and farm entry or between FARMING PREFERENCE TYPE and farm entry. Therefore, null

hypothesis H04 was adopted, which means that a farm entry barrier does not make a significant difference to the farm entry of prospective farmers.

Finally, a multiple mediation effect analysis was conducted to verify whether there is offset among the mediation effects of farm entry policy, farming conditions, and farm entry barriers (Hypothesis 5). The result showed that the total indirect effects of the mediators between COUNTY and farm entry and between FARMING PREFERENCE TYPE and farm entry are significant, and the signs of the mediation effects of ATR FRM, EFF FEP, and EAS FNB are the same. Therefore null hypothesis H05 was adopted, which means that farming conditions and farm entry barriers do not reduce the effect of farm entry policy.

However, it should be kept in mind that the fact that farm entry policy makes a significant difference to the farm entry of prospective farmers in relation to COUNTY and FARMING PEFERENCE TYPE does not means that the policy is effective. All that this indicates is that farm entry policy has a different effect on different prospective farmers.

On the contrary, it seems that farm entry policy is not effective for following reasons. The major reason is that rural born prospective farmers are not more likely to do farming than urban born young people (Section 7.2.4.2). And, as was seen in Section 7.2.3.1, prospective farmers do not show particularly positive attitudes to farm entry policy. Furthermore, according to the interview data collected from agricultural school students and teachers (Section 7.2.3.3), it seems that many prospective farmers do not consider farming as their best job, and some of them even dislike the idea of doing farming, due to the hard physical labor involved and the low income, as well as the less favorable living conditions of rural areas, although it seems that expectations of better prospects for farming and a higher income from a large-scale farming operation do induce some prospective farmers to take farming seriously.

In conclusion, many agricultural school students, i.e. prospective farmers, consider farming as their second best job at best, due to those unfavorable circumstances; and therefore the effect of farm entry policy on them is limited.

Table 7.6 The results of total, direct, and indirect effects in the case of prospective farmers

Independent variables	Direct effect	Mediators	Specific Indirect effect		Total Indirect Effect
			(Uncontrolled)	(Controlled)	
FARMING PREFERENCE TYPE	(+)*	ATR FRM	(+)	(+)	(+)*
		EFF FEP	**(+)***	**(+)***	
		EFF COP	(+)*	(-)	
		EFF RDP	(+)*	(+)	
		EAS FNB	(+)*	(+)	
COUNTY	(-)*	ATR FRM	(-)	(-)	(-)*
		EFF FEP	**(-)***	**(-)***	
		EFF COP	(-)*	(+)	
		EFF RDP	(-)*	(-)	
		EAS FNB	(-)*	(-)	

Note: (1) ATR FRM (Attractiveness of farming), EFF FEP (Effectiveness of farm entry policy), EFF COP (Effectiveness of competitiveness policy), EFF RDP (Effectiveness of rural development policy), EAS FNB (Ease with which entry barriers can be eliminated) (2) "" means the relationship is significant at 95% significance level (3) Signs of "+" ("-") in parentheses indicate the relationship is positive (negative).

7.3 Farm exit of old farmers

7.3.1 Questionnaire distribution and collection

I visited 16 villages in two counties (between February 23, 2009 and March 5, 2009). Three hundred and seventy five questionnaires were distributed and of these 367 were retrieved, giving a 97% retrieval rate. A higher retrieval rate was achieved than for young farmers because most of the data was collected by in-person interview. Of the questionnaires retrieved, 3 in which the respondents had failed to respond to some of the questions were eliminated. Finally, 364 questionnaires were analyzed.

The Statistical Package for Social Sciences (SPSS) 17.0 was used for computing descriptive statistics, internal consistency and validity ratings as well as conducting binary logistics

regression analysis, multiple regression analysis, and bootstrapping.

7.3.2 Description of participants' demographic and socio-economic characteristics

Individual characteristics

Table 7.7 below shows frequencies and percentages for personal information on old farmers, like age, sex, period in farming, farming income, and off-farm income.

Table 7.7 Descriptive statistics of personal characteristics of old farmers (N=364)

Variables	Categories	Frequencies	Ratio	Cumulative ratio
Age	Under 60	69	19.0	19.0
	60-64	54	14.8	33.8
	65-69	72	19.8	53.6
	70-74	79	21.7	75.3
	75-79	68	18.7	94.0
	80 and over	22	6.0	100.0
Sex	Male	319	87.6	87.6
	Female	45	12.4	100.0
Farming period	Under 10 years	17	4.7	4.7
	10-19 years	26	7.1	11.8
	20-29 years	20	5.5	17.3
	30-39 years	50	13.7	31.0
	40-49 years	84	23.1	54.1
	50 and over	167	45.9	100.0
Farming income	Under1,000 KRW	225	61.8	61.8
	1,000-under 2,000 KRW	57	15.7	77.5
	2,000-under 3,000 KRW	24	6.6	84.1
	3,000KRW and over	58	15.9	100.0
Number of no-farm job	One or more	42	11.5	11.5
	None	322	88.5	100.0
Off-farm income	None	257	70.6	70.6
	Under1000 KRW	73	20.1	90.7
	1,000-2,000 KRW	9	2.5	93.1
	2,000-3,000 KRW	11	3.0	96.2
	3,000 KRW and over	14	3.8	100.0
Years of schooling	No schooling	23	6.3	6.3
	Elementary school	223	61.3	67.6
	Middle school	48	13.2	80.8
	High school	47	12.9	93.7
	University	23	6.3	100.0

Characteristics of families

Table 7.8 below shows frequencies and percentages for the characteristics of old farmers' families, like the number of children, whether they were farming with their spouse or not, and whether or not the parents received help from the children.

Table 7.8 Descriptive statistics for old farmers' families (N=364)

Variables	categories	Frequencies	Ratio	Cumulative ratio
Children	One	16	4.4	4.4
	Two	60	16.5	20.9
	Three	100	27.5	48.4
	Four	90	24.7	73.1
	Five and over	98	26.9	100.0
Farming with spouse or not	With spouse	294	80.8	80.8
	Without spouse	70	19.2	100.0
Help or not	With help	8	2.2	2.2
	Without help	356	97.8	100.0

Characteristics of farmland

Table 7.9 below shows frequencies and percentages for the characteristics of old farmers' farmland, like location and farming produce.

Table 7.9 Descriptive statistics of old farmers' farmlands (N=345)

Variables	Categories	Frequencies	Ratio	Cumulative ratio
Region	City	5	1.4	1.4
	County	359	98.6	100.0
Farming produce	Crops	154	42.3	42.3
	Crops and livestock	16	4.4	46.7
	Vegetables, fruit, and flowers	12	3.3	50.0
	Crops, vegetables, fruit, and flowers	154	42.3	92.3
	Crop, vegetables, fruit, flowers, and livestock	13	3.6	95.9
	Landscape and other produces	15	4.1	100.0

Type

Table 7.10 below shows the frequencies and percentages of old farmers' individual types.

Table 7.10 Descriptive statistics of types of old farmers

Variables	Categories	Frequencies	Ratio	Cumulative ratio
Types	Livelihood type	242	66.5	66.5
	Income maximization type	53	14.6	81.0
	Unconditional leisure type	69	19.0	100.0

7.3.3 General findings

7.3.3.1 Attitudes to farming, agricultural structural adjustment policy, farm exit barriers, and farm exit

Attitudes to farming

Table A.16 in Appendix A shows the frequencies, means, and standard deviations of old farmers' attitudes to farming as a job. Old farmers do not agree that it is farming income that induces them to continue farming (M=2.23, SD=.686), that prospects for farming are bright (M=2.42, SD=.729), that rural areas are convenient to live in (M=2.57, SD=0.695), or that being a farmer is a happy life (M=2.55, SD=.679). But they do agree that non-farm jobs can also be physically difficult (M=3.03, SD=.773). These statistics show that old farmers are still farming although they feel that farming is not such an attractive activity.

Attitudes to agricultural structural adjustment policy

Agricultural structural adjustment policy is divided into farm exit policy, competitiveness policy, and rural development policy, and therefore attitudes to agricultural structural adjustment policy are divided into attitudes to farm exit policy, attitudes to competitiveness

policy, and attitudes to rural development policy.

Attitudes to farm exit policy

Table A.17 in Appendix A shows the frequencies, means, and standard deviations of five items used to measure attitudes to farm exit policy. Old farmers tend to deny that the early farm exit program affects farm exit (M=2.74, SD=.816), that the increase in direct payment for farmland transfer facilitates farm exit (M=2.91, SD=.917), or that the present subsidy is adequate (M=2.33, SD=.952). But they hope that the early farm exit program continues (M=3.34, SD=.870), although they do not think it is effective (M=2.97, SD=.839). According to the above, they are not likely to exit farming earlier, even if the subsidy increases.

Attitudes to competitiveness policy

Table A.18 in Appendix A shows the frequencies, means, and standard deviations of five items used to measure attitudes to competitiveness policy. Old farmers do not agree that competitiveness policy makes them continue farming (M=2.42, SD=.913), that they might exit farming without the policy (M=2.08, SD=.893), or that the policy contributes to an increase in farm income (M=2.61, SD=.875) or international competitiveness (M=2.65, SD=.934). Also, they do not want to be supported by the policy (M=2.24, SD=1.027). These attitudes indicate that competitiveness policy does not encourage old farmers to continue farming, even though government intends to create more favorable circumstances for farmers by carrying out the policy. And it is thought that this policy is not likely to delay the exit of old farmers.

Attitudes to rural development policy

Table A.19 in Appendix A shows the frequencies, means, and standard deviations of five items

used to measure old farmers' attitudes to rural development policy. Old farmers' responses to rural development policy are similar to their responses to competitiveness policy. They do not think that rural development policy makes them continue farming (M=2.35, SD=.946), that they might exit from farming without the policy (M=2.04, SD=.900), or that the policy contributes to an increase in farm income (M=2.41, SD=.936) or international competitiveness (M=2.08, SD=.921). Also, they do not want to be supported by the policy (M=2.15, SD=1.104). These findings suggest that rural development policy does not affect the farm exit of old farmers and, therefore it is not likely either to delay or to facilitate of farm exit.

Attitudes to farm exit barriers

As is seen in Table A.20 in Appendix A, about 66% of old farmers indicated shortage of income after retirement as the most influential farm exit barrier, and the absence of non-farm job opportunities and farming debt followed this with rates of 14% and 9% respectively. However, absence of successors accounted for only 3% of non-exit. Therefore, it is likely that the cause of the increase in the average age of farmers in Korea is not due to delay in farm entry but to delay in farm exit.

Table A.21 in Appendix A shows the frequencies, means, and standard deviations of five items used to measure the attitudes to farm exit barriers which old farmers expressed. The farmers' responses suggested that farm exit barriers do not discourage them from leaving farming (M=2.46, SD=.824), nor do these barriers make them more passive in preparing for their exit from farming (M=2.45, SD=.793). Furthermore, the farmers believe that they can exit from farming even if they do not overcome farm exit barriers (M=2.91, SD=.876). But they are not confident that they can eliminate farm exit barriers for themselves (M=2.36, SD=.843). From

these responses, it can be estimated that farm exit barriers are not the critical factors which prevent farmers from exiting from farming, although these farmers do seem to have difficulty in eliminating such barriers.

Attitudes to farm exit

Table A.22 in Appendix A shows the frequencies, means, and standard deviations of five items used to measure the intentions of old farmers about their exit from farming. Old farmers tend to think that they want to give up farming when they meet retired people (M=3.06 SD=.923) and decide that farming is hard work (M=3.62, SD=.990). But they do not want to sell or lease their farmland (M=2.86, SD=.936), they do not entertain the hope that someone willing to cultivate their farmland will appear (M=2.80, SD=.952), and they are not looking forward to enjoying life once they have retired (M=2.94, SD=.929). These attitudes mean that they have every intention of leaving farming one day, but they do not want to leave it now. That is, they want to exit from farming, but they hesitate to implement this wish.

The old farmers were questioned about whether they would have to exit farming at a particular time, due to an agreement with their children, other people, or the government. Their responses showed that the ratio of old farmers who are scheduled to exit from farming in a set number of years was only 1%. The others (99%) have no plans for farm exit, or already want to exit from farming of their own accord, as can be seen in Table A.24 in Appendix A.

7.3.3.2 Reliability and validity tests

Reliability test

As in the case of prospective farmers, the reliability of the measurements that produced these

findings was estimated by using Cronbach's alpha coefficient. The Cronbach alpha coefficients in Table 7.11 are ranged from .78 to .92, which means that the measurements are reliable.

Table 7.11 Reliability test statistics for old farmers

Variables	Initial items	Items after elimination	Coefficient Alpha
Attitudes to farming (Ⅲ.1-Ⅲ.5)	5	5	0.777
Attitudes to farm exit policy (Ⅳ.1.1-Ⅳ.1.5)	5	5	0.837
Attitudes to competitiveness policy (Ⅳ.1.1-Ⅳ.1.5)	5	5	0.906
Attitudes to rural development policy (Ⅳ.1.1-Ⅳ.1.5)	5	5	0.922
Attitudes to farm exit barriers (Ⅴ.2.1-Ⅴ.2.5)	5	5	0.865
Attitudes to farm exit (Ⅵ.1-Ⅵ.5)	5	5	0.917

Validity test

Validity was tested by exploratory factor analysis in the same way that this was done for prospective farmers. The dimensionality of items used to measure attitude to farming, attitude to farm exit policy, attitude to competitiveness policy, attitude to rural development policy, and attitude to farm exit barriers was analyzed by principal components factor analysis. The criterion of Eigenvalue-greater-than-1 was utilized to determine the number of factors to rotate and factors were rotated using a Varimax rotation procedure. Variables which had factor loadings greater than 0.4 and communalities greater than 0.3 were retained as significant variables.

First, as a result of exploratory factor analysis for attitudes to farming, the rotated solution yielded one factor, which was labeled 'attractiveness of farming'. As is seen in Table A.24 in Appendix A, factor loadings were from .691 to .769 and communalities were from .478 to .592. These five items accounted for 53.1% of the item variance.

Second, as a result of exploratory factor analysis for attitudes to farm exit policy, the rotated solution yielded one factor, which was labeled ‘effectiveness of farm exit policy’. As is seen in Table A.25 in Appendix A, factor loadings were from .746 to .818 and communalities were from .557 to .669. These five items accounted for 60.9% of the item variance.

Third, as a result of exploratory factor analysis for attitudes to competitiveness policy, the rotated solution yielded one factor, which was labeled ‘effectiveness of competitiveness policy’. Factor loadings were from .795 to .884 and communalities were from .631 to .782. These five items accounted for 73.0% of the item variance, which is seen in Table A.26 in Appendix A.

Fourth, as a result of exploratory factor analysis for attitudes to rural development policy, the rotated solution yielded one factor, which was labeled ‘effectiveness of rural development policy’. Factor loadings were from .822 to .910 and communalities were from .675 to .828. These five items accounted for 76.6% of the item variance, which is seen in Table A.27 in Appendix A.

Finally, as a result of exploratory factor analysis for attitudes to farm exit barrier, the rotated solution yielded one factor, which was labeled ‘ease of farm exit barrier elimination’. Factor loadings were from .770 to .830 and communalities were from .594 to .688. These five items accounted for 65.2% of the item variance, which is seen in Table A.28 in Appendix A.

7.3.3.3 Open-ended interview data

Group interviews were carried out by standardized and open-ended interview (Patton, 2002) to get information which could not be obtained from a quantitative survey, such as why old farmers do or do not exit farming. The survey took place between 23 February 2009 and 5

March 2009. As in the case of prospective farmers (see Section 7.2.3.3 above), these interviews were designed to provide answers to specific questions and thereby supplement the quantitative findings. Shortly after the old farmers who gathered to participate in the survey had completed their questionnaires, I asked them five questions. The number of old farmers who responded to the questions was between 3 and 15, depending on the village, and they were given the chance to state their views freely and to agree or disagree with the other farmers' views. Four questions were asked one by one. The questions and answers were as follows.

Question 1	***Do you intend to continue farming or exit farming?***
Respondent 1A	*I really want to exit farming now, because I am old and incapable of doing hard farming work any more. (Old farmer)*
Respondent 1B	*I want to quit farming. Who in the world would want to continue hard farming work at this age? (Old farmer.)*
Respondent 1C	*Farming is not profitable any more. I want to lease some of my farmland and just keep a small amount which I can cultivate myself. (Old farmer)*
Respondent 1D	*I can earn a little as long as I do farming. But if I do not farm, I won't be able to earn money to live on. So I will do farming as long as I have the energy to do it, even though farm work is hard. (Old farmer)*

The first question was asked to inquire into whether the old farmers preferred farm exit to farming. It seems that the old farmers would like to exit farming, due to physical problems and old age. The low profitability of farming also seems to induce them to want to exit from farming. But the income from farming, even if it is small, seems to encourage them to continue farming.

Question 2 ***Why do you continue, or why have you left, farming?***

Respondent 2A *Farming is the only thing which old farmers can do in a rural area. Doing something is better than doing nothing for old people. If we do nothing, we cannot keep healthy. (Old farmer)*

Respondent 2B *If I leave farming, I shall have to live an idle life. Definitely, nobody likes this situation. But farmers can take a rest whenever they want during their work. It is different from your occupation, in that you have to go to your office every day. (Old farmer)*

Respondent 2C *It is possible that all the old farmers would prefer not to exit from farming as long as they are capable of the work, because there is no other work to do in this area. (Old farmers)*

Respondent 2D *I have to secure enough food for myself and share it with my children. It is the only thing I can do at my age. (Old farmers).*

Respondent 2E *Farming is my life. We feel happiness when farming. Do you want to retire from your job? Neither do I. (Old farmer).*

Respondent 2F *If I sell my farmland to exit from farming, my children will ask me to distribute the money among them. And when I have no farmland then, the children will ignore me. Furthermore, it is more profitable to do farming in person than to lease farmland. (Old farmer)*

Respondent 2G *Farmland is a family treasure which is inherited from generation to generation. Therefore, I cannot dispose it and I have to hand it over to my children. Then they will visit here occasionally to take care of us, their parents, and to manage the farmland. (Old farmer)*

Respondent 2H *If I leave farming I shall have no choice but to depend on my children. But I do not want to be a burden to my children. (Old farmer)*

Respondent 2I *The age of 70 is still seen as a young age in this village. And the*

seventies are the prime of life, as you can see in this group of people. So who can exit from farming at this age? (Old farmer)

Respondent 2J *Young farmers in my village help with farm work and old people take it in turns to work for each other. Furthermore, mechanization makes farming easier, especially rice farming. So it is easier to farm nowadays than in times past, and old farmers can easily cultivate one hectare of farmland. (Old farmer)*

Respondent 2K *An old man who is aged over 80 lives in the next village. He cultivates about 13 hectares. Last year he bought new farming machinery, like a tractor, with the help of the environment-friendly farming promotion program, although young farmers who are in their forties have failed to take advantage of the program. Age is not a concern for farmers any more. (Old farmer)*

Respondent 2L *About ten years ago, there were many farm households which raised cattle or pigs on a small scale. But those farm households have disappeared, because such farming was not profitable, it was hard to be mechanized, and the quality of animals was inferior to that of the animals of large-scale stock farmers. But rice farming is mechanized now and we can help one another with it. So old farmers can do rice farming even they are over 80. (Old farmer)*

Respondent 2M *Old farmers who cultivate large farms intend to cultivate even more farmland, because it gives them a stable income which is partly supported by government policy. And old farmers who cultivate small amounts of farmland do not want to exit farming either, because farming is their only means of getting a livelihood. (Member of an agricultural cooperative)*

The second question was asked to examine why old farmers wanted or did not want to leave farming. The above responses could be a key to solving the problem that old farmers do not

exit farming despite the fact that they have the intention of exiting and farm exit barriers are not a critical factor in preventing this. It seems that many of old farmers want to continue farming as long as they can do the physical work. Old farmers can overcome physical problems by mechanization and mutual help among themselves, as well as by having an increased life span, which helps them continue farming in spite of getting older. Finally, old farmers do not want to depend on their children and farming is a means of keeping their independence, so this is another factor that makes them continue farming.

Question 3	***What aspects of agricultural structural adjustment policies affect farming and farm exit?***
Respondent 3A	*I do not know much about government policy. Actually, the government will not support old farmers like us. (Old farmer)*
Respondent 3B	*I only want the government to help us improve our income, whatever it does. (Old farmer)*
Respondent 3C	*Do you think we will exit farming if the government encourages us to exit farming? Furthermore, we will not increase the scale of our farming even if the government gives us its support for this. (Old farmer)*
Respondent 3D	*The subsidy paid by the direct payment program for farmland transfer is too small. Furthermore, I would have to quit farming if I accepted supported from the program. How could I live with such a small amount of money from the government? (Old farmer)*
Respondent 3E	*If I exit farming, I cannot get direct payment for rice farming. Then, the*

government compensates me for this! (Old farmer).

The third question was asked in order to look into how old farmers respond to agricultural structural adjustment policy. It seems that many old farmers are indifferent to government policy, because they do not want to be supported by competitiveness policy or rural development policy. Old people just seem to intend to maintain the size of their farms or decrease them a little as they get older, which is the reason that they are not interested in the agricultural policy. Therefore, agricultural structural adjustment policy is thought not to affect the farm exit of old farmers.

Question 4	***What is your motive for farm exit?***
Respondent A	*I got hurt in the waist last year due to farming work, and my condition has still not improved. So I cannot do farming any more. (Old farmer, aged 71)*
Respondent B	*I was parted from my wife by death last year. I cannot do farming work by myself. (Old farmer, aged 77)*
Respondent C	*I will concentrate on my non-farm work, because farming is hard and the income does not cover the expenses. (Old farmer, aged 61)*

The last question was asked to discover why old farmers decide to exit farming. The above answers show that abrupt loss of the ability to labor on the farm, including, for example, an injury or the loss of a spouse, makes them exit from farming. In addition, the lower profitability of farming is a cause of farm exit by old farmers who have a non-farm job.

Conclusion

The main objective of these interviews was to estimate the likelihood of farm exit by old

farmers and the potential effect of agricultural structural adjustment policy on farm exit. Some old farmers do intend to leave farming as they get older, because they feel it is physically difficult to do farming work. But mechanization and mutual help delay farm exit. And also the farmers do not want to exit from farming because they want to remain independent of their children and keep their farmland secure. However, they have no choice but to exit from farming when they lose their physical strength. Accordingly, it is thought that although getting older could affect intentions to exit farming, physical problems are a critical factor which affects the point at which farm exit takes place. This implies that, of the characteristics of old farmers, their physical state is the most likely to affect farm exit. However, agricultural structural adjustment policy is not likely to affect farm exit, mainly because old farmers are not interested in the policy, and the incentives it offers seem not to be so influential as to make them exit. Nevertheless, these observations were made only in two counties, and therefore the applicability of the result could be limited. But it can be applied to people who are aged 60 and over and do small scale rice farming beyond those regions, because the two counties have characteristics that are representative of Korean farming, i.e. small rice farming by old farmers.

7.3.4 Verification of hypotheses

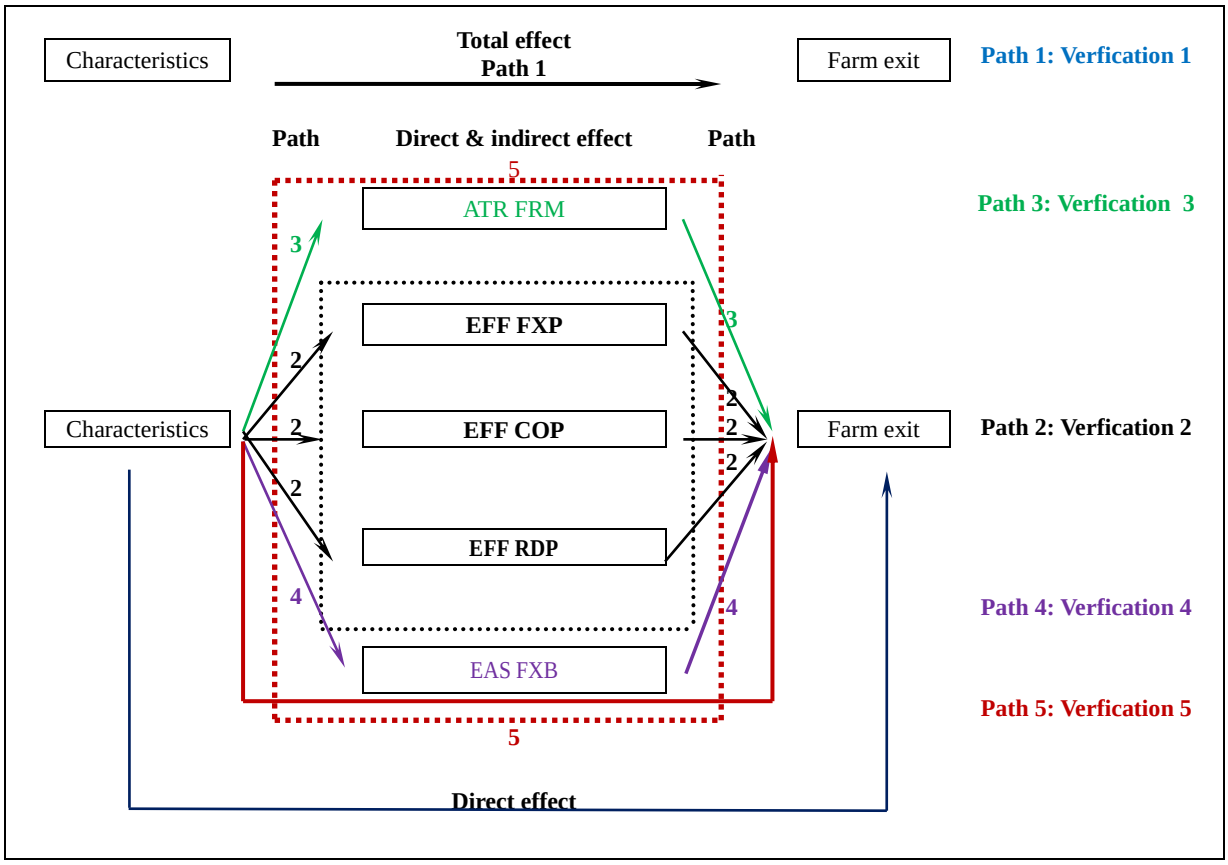
7.3.4.1 Verification procedures

This research investigates whether the personal characteristics of old farmers (independent variables) directly or indirectly affect farm exit (dependent variable) through the attractiveness of farming (ATR FRM), the effectiveness of farm exit policy (EFF FXP), the effectiveness of competitiveness policy (EFF COP), the effectiveness of rural development policy (EFF RDP), and the ease with which farm exit barriers can be eliminated (EAS FXB,

mediators) in order to verify the research hypotheses (Section 6.3.2.2). This is represented as in Figure7.2 below.

First, whether the personal characteristics of old farmers affect farm exit is verified to find the significant variables of farm exit. Then, whether the personal characteristics of old farmers affect farm exit directly or indirectly through the mediators is verified by setting personal characteristics which are proven to affect farm exit in the first step as independent variables.

Figure 7.2 Total, direct, and indirect effect model for farm exit



* Note: ATR FRM (Attractiveness of farming), EFF EXP (Effectiveness of farm exit policy) EFF COP (Effectiveness of competitiveness policy), EFF RDP (Effectiveness of rural development policy), EAS FXB (Ease of farm exit barrier elimination)

The five hypotheses (see Section 6.3.2) are verified as follows. First, Hypothesis 1 is verified by analyzing the total effect of personal characteristics of old farmers on farm exit (Path 1).

Second, Hypothesis 2 is verified by analyzing the indirect effects of personal characteristics of old farmers on farm exit through farm exit policy (EFF FXP), competitiveness policy (EFF COP), and rural development policy (EFF RDP) (Path 2). Third, Hypothesis 3 is verified by analyzing the indirect effect of personal characteristics of old farmers on farm exit through farming conditions (ATR FRM, Path 3). Fourth, Hypothesis 4 is verified by analyzing the indirect effects of personal characteristics of old farmers on farm exit through farm exit barriers (EAS FXB, Path 4). Finally, Hypothesis 5 is verified by analyzing the indirect effects of personal characteristics of old farmers on farm exit through farming conditions (ATR FRM), farm exit policy (EFF FXP), and farm exit barriers (EAS FXB, Path 5).

7.3.4.2 Hypothesis 1

Binary logistic regression analysis was conducted to verify whether characteristics of old farmers affected farm exit. The predictors were 41 dummy variables which represented categorical variables like age, sex, period spent farming, farming income, non-farm job, off-farm income, amount of schooling, whether help was received from children or not, whether farming was done with a spouse or not, location of farm, farming produce, kinds of farm exit barriers, and type, but three dummy variables were removed from analysis due to violation of multicollinearity[11]. The dependent variable was farm exit.

Table A.30 in Appendix A shows B coefficients, Wald, significance value, and Exp (b) by predictors. The model correctly classifies 0% of the old farmers who are scheduled to exit from farming and 100% of the old farmers who have not decided on their future or have

[11] Multicollinearity was checked by using VIF and the cut-off value of VIF was 5 (Hutcheson and Sofroniou, 1999; Menard, 1995). The Variables which has VIF values greater than 5, i.e. two of age dummy variables set - age under 60 (VIF=9.050) and age between 60 and 64 (VIF=5.024) - and a non-farm job dummy variable (VIF=5.165) were removed from analysis. After removing the variables, the values of VIF ranged from 1.165 to 2.357.

decided not to exit from farming with an overall success rate of 98.9% in classification. But the model is not statistically significant, $\chi^2(38, N=364) = 44.043$, p=.231[12]. So, it can be said that the predictors are not significantly associated with farm exit.

The reason that these predictors are not associated with farm exit might be that they do not really affect farm exit. But also it should not be overlooked that the number of old farmers in the sample of those who have decided to exit farming (N=4) is too small to verify the relationships.

Therefore, a multiple regression analysis was conducted by entering intention to exit farming as a proxy variable for farm exit[13]. As a result, the model shows that the characteristics of old farmers are significant predictors of intention to exit farming, F (38, 325) = 6.164, p=.000. The multiple correlation coefficients (R) is .647, which indicates that about 41.9% of variance in intention to exit farming is accounted for by the linear combination of the characteristics of old farmers. Table A.31 in Appendix A shows un-standardized beta coefficient (B), standardized beta coefficient (β), significance values. And the result is interpreted as follows.

First, age is dummy coded into three variables, using the age of 80 and over as the reference group. As a result, there is no significant difference in intentions about farm exit between 65 to 69 and 80 and over (β=.073, t=1.20, p=.23), between 70 to 74 and 80 and over (β=.034, t=.53, p=.60), or between 75 to 79 and 80 and over (β=.098, t=1.55, p=.12). This shows that

[12] The model explained between 11.4% (Cox and Snell R square) and 100.0% (Nagelkerke R square) of the variance

[13] It is assumed that intention directly affects behavior (Fishbein and Ajzen, 1975; Ajzen, 1985, 1991). But it should be noted that researchers have produced mixed result on the relationship between the two (Wong and Sheth, 1985) and there is discrepancy between plan and actual behavior in farm succession (Väre et al, 2004). Meanwhile, prospective farmers' intentions towards farming and farm entry were significantly associated with each other (β=2.257, Wald χ2=77.363, p=.000). Therefore, it is not an unrealistic assumption.

age does not affect intention to exit farming[14].

Second, when sex is dummy coded into 'male', and 'female' is used as a reference group, the intentions of males concerning farm exit are not significantly different from those of females (β=-.094, t=-1.95, p=.05). Accordingly, it can be concluded that sex does not affect intention to exit farming.

Third, when the period spent farming is dummy coded into four variables, using farming experience of 40 years and more as the reference group, there is no significant difference between less than 10 years and 40 and over (β=.003, t=-.51, p=.96), between 10 to 19 and 40 and over (β=.006, t=-.09, p=.93), between 20 to 29 and 40 and over (β=-.028, t=.52, p=.61), or between 30 to 39 and 40 and over (β=-.007, t=-.12, p=.90). This indicates that the period spent farming does not affect farm exit.

Fourth, when farming income is dummy coded into four variables, using less than 10,000 KRW as the reference group, there is no significant difference in intention to exit farming between 10,000 to less than 20,000 and less than 10,000 KRW (β=.047, t=.91, p=.36), between 30,000 to less than 40,000 and less than 10,000 KRW (β=-.030, t=-.55, p=.58), or between 40,000 and over and less than 10,000 KRW (β=-.071, t=-1.38, p=.17). But, there is significant difference between 20,000 to less than 30,000 KRW and less than 10,000 KRW (β=-.114, t=-2.25, p=.03), indicating that old farmers who earns 20,000 to less than 30,000 KRW are likely to have less intention of continuing farming than those who earn less than 10,000 KRW. These results show that farming income conditionally affects intentions about

[14] Age is dummy coded into five variables, using the age of 80 and over as the reference group. As a result, there is no significant difference in intentions about farm exit between under 60 and 80 and over (β=.135, t=1.06, p=.29), between 60 to 64 and 80 and over (β=.089, t=.93, p=.35), between 65 to 69 and 80 and over (β=.130, t=1.52, p=.13), between 70 to 74 and 80 and over (β=.079, t=.94, p=.35), or between 75 to 79 and 80 and over (β=.146, t=1.81, p=.07). This shows that age does not affect intention to exit farming.

farm exit.

Fifth, when old farmers' off-farm income is dummy coded into four variables, using zero off-farm income as the reference group, there is a significant difference between under 10,000 KRW and the reference group (β=-.207, t=-3.83, p=.000) and between 20,000 to less than 30,000 KRW and the reference group (β=-.140, t=-2.69, p=.008) in intentions about farm exit. But the intentions about farm exit of 10,000 to less than 20,000 KRW (β=-.015, t=-.31, p=.75 and 30,000 KRW and over (β=-.083, t=-1.51, p=.13) are not significantly different from those of the reference group. This means that off-farm income conditionally affects intentions about farm exit.

Sixth, when amount of schooling is dummy coded into four variables, using elementary school as the reference group, high school is significantly different from the reference group in intentions about farm exit (β=-.117, t=-2.09, p=.037). But, no schooling (β=.034, t=.73, p=.469), middle school (β=-.031, t=-.62, p=.537), and university (β=.002, t=-.045, p=.964) are not significantly different from the reference group in intentions about farm exit. Therefore, it can be said that the amount of schooling conditionally affects intentions about farm exit.

Seventh, the number of children is dummy coded into four variables using five or more as a reference group. As a result, one person (β=-.021, t=-.41, p=.683), two people (β=-.109, t=-1.81, p=.071), three people (β=-.090, t=-1.57, p=.118), and four people (β=-.052, t=-1.00, p=.320) are not different from the reference group in their intentions about farm exit. This means that old farmers who have more children are not likely to have any more intention of leaving farming than others. Therefore, it can be said that the number of family members does not affect intentions about farm exit.

Eighth, when the characteristic of whether old farmers have a spouse or not is dummy coded into ‘spouse’, using ‘without spouse’ as the reference group, there is a significant difference in intentions about farm exit between the two groups (β=-.167, t=-3.24, p=.001). The result shows that whether or not the farmer has a spouse affects intentions about farm exit, indicating that old farmers who have spouses have less intention of leaving farming than others.

Ninth, when the characteristic of whether farmers receive help from children or not is dummy coded into ‘help’ using ‘without help’ as a reference group, there is a significant difference between the two group (β=-.135, t=-2.86, p=.004). This means that old farmers whose children help them are likely to have less intention of leaving farming than the other group.

Tenth, when region is dummy coded into ‘city’, using ‘county’ as the reference group, there is no significant difference between the two groups (β=.043, t=.93, p=.356). This indicates that farming region does not affect intentions about farm exit.

Eleventh, when farming produce is dummy coded into five variables, using ‘crops’ as the reference group, the intentions about farm exit of farmers with crops and livestock (β=-.024, t=-.48, p=.64), vegetable, fruit, and flowers (β=-.069, t=-1.44, p=.15), crops, vegetable, fruit, and flowers (β=-.033, t=-.61, p=.54), crops, vegetables, fruit, flowers, and livestock (β=-.025, t=-.50, p=.619) or landscape and other produces (β=-.061, t=-1.12, p=.14) are not significantly different from that of the reference group. This means that farming produce does not affect intentions about farm exit and the number types of farming done also does not affect intentions about farm exit.

Twelfth, when kinds of farm exit barriers are dummy coded into four variables using

‘shortage of income’ after retirement as the reference group, there is a significant difference between absence of successors and shortage of income (β=.112, t=2.45, p=.015). But there is no significant difference in intentions about farm exit between absence of other job opportunities and shortage of income (β=-.080, t=-1.64, p=.102), between farming debt and shortage of income (β=.076, t=1.36, p=.176), or between other characteristics and shortage of income (β=.082, t=1.73, p=.085). This result means that kinds of farm exit barriers conditionally affect intentions about farm exit, and old farmers who indicated the absence of a successor as a farm exit barrier are likely to have more intention of leaving farming than those who indicated shortage of income as a farm exit barrier.

Finally, when type is dummy coded into two variables, using ‘leisure preference type’ as the reference group, there is a significant difference between livelihood type and leisure preference type (β=-.207, t=-3.58, p=.000) and between income maximization type and leisure preference type (β=-.228, t=-3.84, p=.000). This means that type affects intentions about farm exit, and farmers who belong to the livelihood type and the income maximization type have less intention of leaving farming than the reference group.

The above results show that age is not associated with farm exit. Therefore, null hypothesis H01 is rejected, which means that agricultural structural adjustment policy, which is intended to make older farmers exit farming, is ineffective, because older farmers are not more likely to exit farming than younger farmers.

In addition, it has been proved that farming income (20,000 to less than 30,000 KRW), off-farm income (less than 10,000 KRW, and 20,000 to less than 30,000 KRW), amount of schooling (high school), and kinds of farm exit barriers (absence of a successor) conditionally affect intentions about farm exit and that type (livelihood type and income maximization type),

whether farmers have a spouse or not, and whether farmers get help from their children or not affect intentions about farm exit.

Accordingly, the above nine dummy coded variables can be entered as independent variables in multiple mediation effect analyses in the following sections. However, farming income (20,000 to less than 30,000 KRW), off-farm income (less than 10,000 KRW, and 20,000 to less than 30,000 KRW), amount of schooling (high school), and kinds of farm exit barriers (absence of a successor) are excluded from the set of independent variables for multiple mediation effect analysis. This is because these variables are conditionally associated with intentions about farm exit. Therefore, whether farmers receive help from children or not (HELP), whether they have a spouse or not (SPOUSE) and type (LIVELIHOOD TYPE and INCOME MAXIMIZATION TYPE) are used as independent variables.

7.3.4.3 Hypothesis 2

In this section, whether farm exit policy, competitiveness policy, and rural development policy mediate between the personal characteristics of old farmers and farm exit, as well as whether there is offset between their mediation effects, is verified. The mediation effects of farm exit policy, competitiveness policy, and rural development policy are analyzed in order, and then we investigate whether or not there is offset between the mediation effects of the three policies.

Verification of the mediation effect of the effectiveness of farm exit policy (EFF FXP) between the personal characteristics of old farmers and farm exit

A multiple mediation effect analysis was conducted to verify whether EFF FXP mediates the relationship between four characteristics of old farmers, that is, HELP, SPOUSE,

LIVELIHOOD TYPE, and INCOME MAXIMIZATION TYPE (independent variables), and intentions about farm exit.

First, HELP is entered as the independent variable, and EFF FXP and intentions about farm exit are entered as the mediator and the dependent variable respectively. As a result, HELP is directly associated with intentions about farm exit (β=-.9812, t=-3.00, p=.0028), but the two are not indirectly associated through EFF FXP (a point estimate: -.0438, 95% BCa CI: -.0173 to .1822). This indicates that EFF FXP does not mediate the relationship between the two, which is which is because neither the relationship between HELP and EFF FXP (β=.6660, t=1.86, p=.0637) nor that between EFF FXP and intentions about farm exit (β=.0657, t=1.37, p=.1706) are significant.

Second, SPOUSE is entered as the independent variable, and the mediator and dependent variable are the same as above. Although SPOUSE is directly associated with intentions about farm exit (β=-.5292, t=-4.19, p=.0000), the two are not indirectly associated with each other through EFF FXP (a point estimate: -.0112, 95% BCa CI: -.0633 to .0072). This is because the relationships between SPOUSE and EFF FXP (β=-.1708, t=-1.22, p=.2198) and between EFF FXP and intentions about farm exit are not significant. This means that EFF FXP does not mediate the relationship between SPOUSE and intentions about farm exit.

Third, LIVELIHOOD TYPE is entered as the independent variable, and the mediator and dependent variable are the same as above. As a result, LIVELIHOOD TYPE is directly associated with intentions about farm exit (β=-.6354, t=-4.96, p=.0000) but it is not indirectly associated with intentions about farm exit through EFF FXP (a point estimate: -.0061, 95% BCa CI: -.0525 to .0115). This is because the relationships between LIVELIHOOD TYPE and EFF FXP (β=-.0929, t=-.65, p=.5105) and between EFF FXP and intentions about farm exit

are not significant. This means that EFF FXP does not mediate the effect of LIVELIHOOD TYPE on farm exit.

Finally, INCOME MAXIMIZATION TYPE is entered as the independent variable, and the mediator and dependent variable are the same as above. As a result, INCOME MAXIMIZATION TYPE is directly associated with farm exit (β=-1.1127, t=-6.70, p=.0000) but it is not indirectly associated with farm exit through EFF FXP (a point estimate: .0044, 95% BCa CI: -.0159 to .0557). This is because the relationships between INCOME MAXIMIZATION TYPE and EFF FXP (β=.0667, t=-.36, p=.7154) and between EFF FXP and intentions about farm exit are not significant. This indicates that EFF FXP does not mediate the effect of INCOME MAXIMIZATION TYPE on intentions about farm exit.

To sum up, EFF FXP does not mediate the relationship between the personal characteristics of old farmers and intentions about farm exit. This indicates that farm exit policy does not make a difference in the intentions about farm exit among old farmers.

Verification of the mediation effect of the effectiveness of competitiveness policy (EFF COP) between the characteristics of old farmers and intentions about farm exit

A multiple mediation effect analysis was conducted to verify whether the effectiveness of competitiveness policy (EFF COP) mediates between four characteristics of old farmers, that is HELP, SPOUSE, LIVELIHOOD TYPE, and INCOME MAXIMIZATION TYPE, and intentions about farm exit.

First, HELP is entered as the independent variable, the mediator is EFF COP, and the dependent variable is intentions about farm exit. The results show that HELP is directly associated with intentions about farm exit (β=-.6793, t=-2.24, p=.0255), but it is not indirectly

associated with intentions about farm exit through EFF COP (a point estimate: -.2582, 95% BCa CI: -.6336 to .2295). This indicates that EFF COP does not mediate between HELP and intentions about farm exit, despite the fact that both the relationship between HELP and EFF COP (β=.7021, t=2.08, p=.0376) and that between EFF COP and intentions about farm exit (β=-.3678, t=-7.78, p=.0000) are significant. This kind of paradoxical result can occur in multiple tests which differ in statistical power (Preacher and Hayes, 2008).

Second, SPOUSE is entered as the independent variable, and the mediator and dependent variable are the same as above. SPOUSE is directly associated with intentions about farm exit (nt-.5825, t=-4.98, p=.0000), but it is not indirectly associated with intentions about farm exit through EFF COP (a point estimate: .0421, 95% BCa CI: -.0651 to .1616). This is because the relationship between SPOUSE and EFF COP is not significant (β=-.1144, t=-.87, p=.3816). This indicates that competitiveness policy does not mediate between SPOUSE and intentions about farm exit.

Third, INCOME MAXIMIZATION TYPE is entered as the independent variable, and the mediator and dependent variable are the same as above. The results show that INCOME MAXIMIZATION TYPE is directly (β=-.6890, t=-4.22, p=.0000) and indirectly (a point estimate: -.4194, 95% BCa CI: -.5872 to -.2774) associated with intentions about farm exit through EFF COP. And the indirect effect is still significant (a point estimate: -.3972, 95% BCa CI: -.6628 to -.1795) when the other mediators (EFF FXP, EFF RDP, ATR FRM, and EAS FXB) are controlled. This result means that competiveness policy partially mediates the relationship between INCOME MAXIMIZATION TYPE and intentions about farm exit.

Finally, LIVELIHOOD TYPE is entered as the independent variable, and the mediator and dependent variable are the same as above. The results show that LIVELIHOOD TYPE is

directly (β=-.5217, t=-4.36, p=.0000) and indirectly (a point estimate: -.1198, 95% BCa CI: -.2291 to -.0251) associated with intentions about farm exit through EFF COP. When the other mediators are simultaneously entered in the model, it is still indirectly associated with intentions about farm exit through EFF COP (a point estimate: -.1135, 95% BCa CI: -.2577 to -.0252). This means that competitiveness policy partially mediates the effects of LIVELIHOOD TYPE on intentions about farm exit. To be specific, old farmers who belong to the LIVELIHOOD TYPE have less intention of leaving farming than those who belong to the leisure preference type, which is partly due to the fact that the former finds competitiveness policy more effective than the reference group (β=.3257, t=-3.94, p=.0001), which in turn leads the former to have less intention of leaving farming (β=-.3483, t=-3.45, p=.0006).

To sum up, EFF COP partially mediates the relationship between LIVELIHOOD TYPE and intentions about farm exit and between INCOME MAXIMIZATION TYPE and intentions about farm exit. But EFF COP does not mediate between HELP and intentions about farm exit and SPOUSE and intentions about farm exit. This indicates that competitiveness policy does make a significant difference in intentions about farm exit.

Verification of the mediation effect of the effectiveness of rural development policy (EFF RDP) between the characteristics of old farmers and intentions about farm exit

A multiple mediation effect analysis was conducted to verify whether EFF RDP mediates between four characteristics of old farmers, that is HELP, SPOUSE, LIVELIHOOD TYPE, and INCOME MAXIMIZATION TYPE, and intentions about farm exit.

First, HELP is entered as the independent variable, and EFF RDP and intentions about farm exit are entered as the mediator and dependent variable respectively. The results show that

HELP is directly associated with intentions about farm exit (β=-.6954, t=-2.12, p=.0274), but it is not indirectly associated with intentions about farm exit through EFF RDP (a point estimate: -.2421, 95% BCa CI: -.5665 to .2170), despite the fact that the relationships between HELP and EFF RDP (β=.8290, t=2.53, p=.0116) and between EFF RDP and intentions about farm exit (β=-.2921, t=-5.80, p=.0000) are significant. Accordingly, it can be said that EFF RDP does not mediate between HELP and intentions about farm exit.

Second, SPOUSE is entered as the independent variable, and the mediator and dependent variable are the same as above. The results show that SPOUSE is directly associated with intentions about farm exit (β=-.5836, t=-4.82, p=.0000), but it is not indirectly associated with intentions about farm exit through EFF RDP (a point estimate: .0432, 95% BCa CI: -.0307 to .1298). This is because SPOUSE is not associated with EFF RDP (β=-.1478, t=-1.16, p=.2443). This indicates that EFF RDP does not mediate between SPOUSE and intentions about farm exit.

Third, LIVELIHOOD TYPE is entered as the independent variable, and the mediator and dependent variable are the same as above. The results show that LIVELIHOOD TYPE is directly (β=-.5420, t=-4.37, p=.0000) and indirectly associated with intentions about farm exit through EFF RDP (a point estimate: -.0995, 95% BCa CI: -.1839 to -.0321). However, the indirect effect of LIVELIHOOD TYPE on intentions about farm exit through EFF RDP becomes insignificant (a point estimate: .0383, 95% BCa CI: -.0179 to .1437) when the other four mediators are controlled. This means that EFF RDP does not mediate the relationship between LIVELIHOOD TYPE and intentions about farm exit.

Finally, INCOME MAXIMIZATION TYPE is entered as the independent variable, and the mediator and dependent variable are the same as above. The results show that INCOME

MAXIMIZATION TYPE is directly (β=-.7253, t=-4.21, p=.0000) and indirectly (a point estimate: -.3830, 95% BCa CI: -.5606 to -.2310) associated with intentions about farm exit through EFF RDP. However, when the other four mediators are simultaneously entered in the model, the mediation effect of EFF RDP becomes insignificant (a point estimate: .1474, 95% BCa CI: -.1005 to .4292), because the relationship between EFF RDP and intentions about farm exit is not significant (β=.1124, t=1.29, p=.1957). This means that EFF RDP does not mediate between the two.

To sum up, EFF RDP does not mediate between HELP and intentions about farm exit, between SPOUSE and intentions about farm exit, between LIVELIHOOD TYPE and intentions about farm exit, or between INCOME MAXIMIZATION TYPE and intentions about farm exit. This means that rural development policy does not make a difference in intentions about farm exit.

Verification of offset between the mediation effects of EFF FXP, EFF COP, and EFF RDP between the characteristics of old farmers and intentions about farm exit

Farm exit policy directly aims to facilitate the farm exit of old farmers. But competitiveness policy and rural development policy encourage them to carry on farming by increasing the profitability of their farming, as well as facilitating farm exit by helping them get another job. In this way, from the perspective of farm exit policy, the effects of that policy could be canceled by those of competitiveness policy and rural development policy. The method of verifying offset between the policies is the same as that described in Section 7.2.4.3.

A multiple mediation effect analysis was conducted to verify whether EFF COP and EFF RDP offset the mediation effect of EFF FXP.

First, HELP is entered as the independent variable, EFF FXP, EFF COP and EFF RDP are entered as the mediators, and intentions about farm exit are entered as the dependent variable. The results show that the direct effect of HELP on intentions about farm exit is negative (β=-.7793, t=-2.60, p=.0097) and the indirect effect through EFF FXP, EFF COP and EFF RDP is also negative (a point estimate: -.1582, 95% BCa CI of -.5379 to .3032). The results of the analysis also show that the signs of the three specific mediation effects are not the same. The signs of EFF FXP (a point estimate: .1063, 95% BCa CI of .0020 to .2887) and EFF RDP (a point estimate: .0734, 95% BCa CI of -.0686 to .4166) are positive, but the sign of the mediation effect of EFF COP (a point estimate: -.3379, 95% BCa CI of -.8398 to .2478) is negative. When the other two mediators are controlled, the signs of EFF FXP (a point estimate: .1162, 95% BCa CI of -.0046 to .3069) and EFF RDP (a point estimate: .0932, 95% BCa CI of -.0587 to .4386) are still positive, and EFF COP is still negative (a point estimate: -.2446, 95% BCa CI of -.6614 to .1269). But the total indirect effect is not significant (a point estimate: -.0265, 95% BCa CI: -.4627 to .3445). Therefore, it can not be said that there is offset between EFF FXP and EFF COP[15].

Second, SPOUSE is entered as the independent variable, and the mediators and dependent variable are the same as above. The results show that SPOUSE is negatively associated with intention to exit farming (β=-.5551, t=-4.81, p=.0000), but the indirect effect through the three mediators is positive (a point estimate: .0147, 95% BCa CI of -.1034 to .1412), which is because the specific mediation effect of EFF COP (a point estimate: .0550, 95% BCa CI of -.0832 to .2195) entirely cancels out the mediation effect of farm exit policy (a point estimate: -

[15] In this case, EFF FXP is a suppressor between HELP and intentions about farm exit. But, as is seen in Section 7.2.4.3, EFF FEP is set as a mediator and the suppression effect is determined by signs between mediators, and, therefore, this research determines suppression between mediators by comparing their signs irrespective of compatibility of the signs between the direct effect of HELP and the mediation effect of EFF FXP.

.0273, 95% BCa CI of -.0903 to .0176) and rural development policy (a point estimate: -.0131, 95% BCa CI of -.0977 to .0093). This case indicates that farm exit policy and rural development policy indirectly cause old farmers who work with their spouses to have less intention of leaving farming, but competitiveness policy gives them more intention of leaving farming. And when the other two mediators are controlled, the signs of EFF FXP (a point estimate: -.0298, 95% BCa CI of -.0972 to .0188) and EFF RDP (a point estimate: -.0166, 95% BCa CI of -.1045 to .0086) are still positive, and EFF COP is still negative (a point estimate: .0398, 95% BCa CI of -.0536 to .1736). But the total indirect effect is not significant (a point estimate: -.0445, 95% BCa CI: -.1888 to .0944). Therefore, it can not be said that there is offset between EFF FXP and EFF COP.

Third, LIVELIHOOD TYPE is entered as the independent variable, and the mediators and dependent variable are the same as above. The results show that both the direct (β=-.5001, t=-4.23, p=.0000) and indirect effects through the three mediators (a point estimate: -.1414, 95% BCa CI of -.2734 to -.0237) are negative. Meanwhile, the specific mediation effects of EFF FXP (a point estimate: -.0148, 95% BCa CI of -.0678 to .0356) and EFF COP (a point estimate: -.1568, 95% BCa CI of -.3254 to -.0360) are negative, but the mediation effect of EFF RDP (a point estimate: .0302, 95% BCa CI of -.0229 to .1288) is positive. When the other two mediators are controlled, the signs of the mediation effects of EFF FXP (a point estimate: -.0162, 95% BCa CI of -.0732 to .0374), EFF COP (a point estimate: -.1153, 95% BCa CI of -.2577 to -.0252), and EFF RDP (a point estimate: .0383, 95% BCa CI of -.0179 to .1437) remain the same, indicating offset between them.

Finally, INCOME MAXIMIZATION TYPE is entered as the independent variable, and the mediators and dependent variable are the same as above. The results show that the direct effect

of INCOME MAXIMIZATION TYPE (β=-.6864, t=-4.18, p=.0000) and the total indirect effect through the three mediators (a point estimate: -.4220, 95% BCa CI of -.6123 to -.2540) are negative. The analysis also shows that the mediation effect of EFF COP is negative (a point estimate: -.5488, 95% BCa CI of -.8348 to -.3191), but the mediation effects of EFF FXP (a point estimate: .0107, 95% BCa CI of -.0442 to .0761) and EFF RDP (a point estimate: .1162, 95% BCa CI of -.1260 to .3960) are positive. The signs of the mediation effects of EFF FXP (a point estimate: .0116, 95% BCa CI of -.0481 to .0820), EFF COP (a point estimate: -.3972, 95% BCa CI of -.6666 to -.1821), and EFF RDP (a point estimate: .1474, 95% BCa CI of -.0981 to .4327) remain same when the other two mediators are controlled.

To sum up, the mediation effect of EFF FXP is totally or partially cancelled by EFF COP or EFF RDP, which means that competitiveness policy or rural development policy reduces the effect of farm exit policy.

Results: Verification of Hypothesis 2

As is seen in the above analyses, farm exit policy does not make a significant difference in the intention of old farmers to exit farming, and competitiveness policy or rural development policy cancels the effect of farm exit policy. Therefore, the null Hypothesis H02 is rejected. This means that farm exit policy does not contribute to the intention of old farmers to exit farming, and competitiveness policy or rural development policy reduces the effect of farm exit policy.

7.3.4.4 Hypothesis 3

A multiple mediation effect analysis was conducted to verify whether the attractiveness of

farming (ATR FRM) mediated the effects of characteristics of old farmers like HELP, SPOUSE, LIVELIHOOD TYPE, and INCOME MAXIMIZATION TYPE, when it came to intentions about farm exit.

First, the independent variable is HELP, the mediator is ATR FRM, and the dependent variable is intentions about exiting farming. As a result, although HELP is directly associated with intentions about farm exit (β=-.9794, t=-3.12, p=.0019), ATR FRM does not mediate the effect of HELP on intentions about farm exit (a point estimate: .0420, 95% BCa CI: -.0929 to .2304).

Second, SPOUSE is entered as the independent variable, and the mediator and dependent variable are the same as above. The results show that SPOUSE is directly (β=-.4717, t=-3.85, p=.0000) and also indirectly (a point estimate: -.0688, 95% BCa CI: -.1663 to .0002) associated with intentions about farm exit through ATR FRM. And SPOUSE is directly (β=-.4717, t=-3.85, p=.0000) and also indirectly associated with intentions about farm exit through ATR FRM, with a point estimate of -.0366 and 95% BCa CI of -.1067 to -.0019 when the other four mediators are controlled. These results show that ATR FRM partially mediates the relationship between SPOUSE and intentions about farm exit. Old farmers who do farming with their spouses have less intention of leaving farming than others. This is partly because the former find farming more attractive than the latter (β=.2740, t=2.03, p=.0424), which in turn makes them have less intention of leaving farming (β=-.1335, t=-2.85, p=.0046).

Third, LIVELIHOOD TYPE is entered as the independent variable, and the mediator and dependent variable are the same as above. When only ATR FRM is entered as the mediator, LIVELIHOOD TYPE is directly (β=-.5365, t=-4.28, p=.0000) and indirectly (a point estimate: -.1050, 95% BCa CI: -.1998 to -.0404) associated with farm exit. And, when the other four mediators are simultaneously entered in the model, LIVELIHOOD TYPE is also directly (β=-

.4267, t=-3.67, p=.0003) and indirectly (a point estimate: -.0559, 95% BCa CI: -.1338 to -.0146) associated with farm exit through ATR FRM. In detail, LIVELIHOOD TYPE has less intention of farm exit than leisure preference type, which is partly because LIVELIHOOD TYPE feels farming to be more attractive than leisure preference type (β=.4184, t=3.06, p=.0023), which in turn causes them to have less intention to exit farming (β=-.1335, t=-2.85, p=.0046).

Finally, INCOME MAXIMIZATION TYPE is entered as the independent variable, and the mediator and dependent variable are the same as above. The results show that INCOME MAXIMIZATION TYPE is directly (β=-.8778, t=-5.28, p=.0000) and indirectly (a point estimate: -.2305, 95% BCa CI: -.3749 to -.1223) associated with intention to exit farming through ATR FRM. And it is still indirectly associated with intention to exit farming (a point estimate: -.1226, 95% BCa CI: -.2594 to -.0366) through ATR FRM, when the other mediators are controlled. This means that LIVELIHOOD TYPE has less intention to exit farming than leisure preference type, which is partly because the former feels farming to be more attractive than the latter (β=-.9185, t=-5.18, p=.0000) which causes them to have less intention of leaving farming (β=-.1335, t=-2.85, p=.0046). In this way, ATR FRM partially mediates the relationship between INCOME MAXIMIZATION TYPE and farm exit.

In conclusion, ATR FRM mediates the effects of SPOUSE, LIVELIHOOD TYPE, and INCOME MAXIMIZATION TYPE on intentions about farm exit. And, therefore, null Hypothesis H03 is rejected, and it can be concluded that ATR FRM makes a significant difference in intentions about farm exit.

7.3.4.5 Hypothesis 4

A multiple mediation effect analysis was conducted to verify whether EAS FXB mediated between the characteristics of old farmers, like HELP, SPOUSE, LIVELIHOOD TYPE, and INCOME MAXIMIZATION TYPE, and intentions about farm exit.

First, HELP is entered as the independent variable, EAS FXB is entered as the mediator, and intentions about farm exit are entered as the dependent variable. The results show that HELP is directly associated with intentions about farm exit (β=-.9140, t=-2.99, p=.0029) but it is not indirectly associated with intentions about farm exit through EAS FXB (a point estimate: -.0235, 95% BCa CI: -.3023 to .2297). This is because the relationship between HELP and EAS FXB (β=.0711, t=.20, p=.8353) is insignificant. This means that EAS FXB does not mediate between HELP and intentions about farm exit.

Second, SPOUSE is entered as the independent variable, and the mediator and dependent variable are the same as above. The results show that SPOUSE is directly associated with intentions about farm exit (β=-.5382, t=-4.54, p=.0000), but it is not indirectly associated with intentions about farm exit through EAS FXB (a point estimate: -.0023, 95% BCa CI: -.0943 to .0907). This is because the relationship between SPOUSE and EAS FXB is not significant (β=.0069, t=.05, p=.9584). This indicates that EAS FXB does not mediate between SPOUSE and intentions about farm exit.

Third, LIVELIHOOD TYPE is entered as the independent variable, and the mediator and dependent variable are the same as above. The results show that LIVELIHOOD TYPE is directly associated with intentions about farm exit (β=-.5252, t=-4.32, p=.0000), and it is also indirectly associated with intentions about farm exit through EAS FXB (a point estimate: -

.1163, 95% BCa CI: -.2193 to -.0198). The indirect effect of LIVELIHOOD TYPE remains significant when the other four mediators are controlled (a point estimate: -.0675, 95% BCa CI: -.1605 to -.0120). This indicates that LIVELIHOOD TYPE finds it easier to eliminate farm exit barriers than leisure preference type does (β=.3524, t=2.61, p=.0093), which in turn means that LIVELIHOOD TYYPE has less intention of leaving farming. Accordingly, EAS FXB partially mediates between LIVELIHOOD TYPE and intentions about farm exit.

Finally, INCOME MAXIMIZATION TYPE is entered as the independent variable, and the mediator and dependent variable are the same as above. As a result, INCOME MAXIMIZATION TYPE is directly (β=-.7397, t=-4.49, p=.0000) and indirectly associated with intentions about farm exit through EAS FXB (a point estimate: -.3686, 95% BCa CI: -.5403 to -.2275). The indirect effect remains significant (a point estimate: -.2140, 95% BCa CI: -.3820 to -.0725) when the other four mediators are controlled. This indicates that EAS FXB partially mediates between INCOME MAXIMIZATION TYPE and intentions about farm exit.

In conclusion, EAS FXB partially mediates between LIVELIHOOD TYPE and intentions about farm exit and between INCOME MAXIMIZATION TYPE and intentions about farm exit. Therefore, null hypothesis H04 is rejected, and it can be concluded that EAS FXB makes a significant difference in intentions about farm exit.

7.3.4.6 Hypothesis 5

A multiple mediation effect analysis was conducted to verify whether ATR FRM and EAS FXB offset the mediation effect of EFF FXP between the personal characteristics of old farmers and farm exit.

First, HELP is entered as the independent variable, and ATR FRM, EFF FXP, and EAS FXB

are entered as the mediators controlling FEE COP and EFF RDP. Intentions about farm exit are entered as the dependent variable. The results show that HELP is directly associated with intentions about farm exit (β=-.9109, t=-3.11, p=.0042) but it is not indirectly associated with intentions about farm exit (a point estimate: -.0265, 95% BCa CI of -.4627 to .3445). The results also show that the sign of the mediation effect of ATR FRM (Section 7.3.4.3) is the same as that of EFF FXP (Section 7.3.4.2), but the sign of the mediation effect of EAS FXB (Section 7.3.4.5) is the opposite to that of EFF FXP (Section 7.3.4.2). But it can not be said that there is offset between EFF FXP and EAS FXB because the total indirect effect is not significant (Section 7.3.4.3).

Second, SPOUSE is entered as the independent variable, and the mediators and dependent variable are the same as above. Although SPOUSE is directly associated with farm exit (β=-.4960, t=-4.38, p=.0000), it is not indirectly associated with intentions about farm exit through the mediators (a point estimate: -.0445, 95% BCa CI of -.1888 to .0944). The signs of the mediation effects of ATR FRM (Section 7.3.4.3), EFF FXP (Section 7.3.4.2), and EAS FXB (Section 7.3.4.5) are the same, which indicates that there is no offset between them.

Third, LIVELIHOOD TYPE is entered as the independent variable, and the mediators and dependent variable are the same as above. The results show that SPOUSE is directly (β=-.4267, t=-3.67, p=.0003) and indirectly (a point estimate: -.2148, 95% BCa CI of -.3630 to .0742) associated with intentions about farm exit through the mediators. The results also show that the signs of the mediation effects of ATR FRM (Section 7.3.4.3), EFF FXP (Section 7.3.4.2), and EAS FXB (Section 7.3.4.5) are the same, which indicates there is no offset between them.

Finally, INCOME MAXIMIZATION TYPE is entered as the independent variable, and the

mediators and dependent variable are the same as above. As a result, INCOME MAXIMIZATION TYPE is directly (β=-.5335, t=-3.27, p=.0012) and indirectly (a point estimate: -.5749, 95% BCa CI of -.7913 to -.3762) associated with intentions about farm exit, which indicates that the mediators partially mediate between INCOME MAXIMIZATION TYPE and intentions about farm exit. The signs of the mediation effects of ATR FRM (Section 7.3.4.3) and EAS FXB (Section 7.3.4.5) are the opposite to that of EFF FXP (Section 7.3.4.2), indicating offset between EFF FXP, ATR FRM, and EAS FXB.

In conclusion, ATR FRM and EAS FXB cancel the mediation effect of EFF FXP (INCOME MAXIMIZATION TYPE). Therefore, null hypothesis H05 is rejected, and it can be concluded that ATR FRM and EAS FXB reduce the effect of EFF FXP.

7.3.5 Summary and conclusions

The five hypotheses (Section 6.3.2.2) were verified to address the research question of why agricultural structural adjustment policy does not stop the trend towards an increase in the number of old farmers. The results are summarized in Table 7.12.

First, a binary logistic regression analysis was conducted to verify whether one characteristic, the age, of old farmers affects farm exit (Hypothesis 1). The results proved that the age of old farmers does not affect farm exit or intentions about farm exit. Therefore, null Hypothesis 01 is rejected. It must therefore be concluded that agricultural structural adjustment policy, which is intended to encourage older farmers to exit from farming, is ineffective because older farmers are not more likely to exit farming than younger farmers.

Second, multiple mediation effect analyses were conducted to investigate whether farm exit policy, competitiveness policy, and rural development policy mediate between the personal

characteristics of old farmers and intentions about farm exit, and whether there is offset among them (Hypothesis 2). The results showed that farm exit policy does not mediate between the personal characteristics of old farmers and intentions about farm exit. In addition, competitiveness policy offsets the mediation effect of farm exit policy between INCOME MAXIMIZATION TYPE and intentions about farm exit, and rural development policy offsets the mediation effect of farm exit policy between LIVELIHOOD TYPE and intentions about farm exit. Therefore, null hypothesis H02 is rejected. In conclusion, farm exit policy does not make a significant difference in intentions about farm exit and the effect of farm exit policy is reduced by competitiveness policy and rural development policy.

Third, multiple mediation effect analyses were conducted to investigate whether farming conditions(ATR FRM) mediated between the personal characteristics of old farmers and intentions about farm exit (Hypothesis 3). The results showed that ATR FRM mediates the effect of SPOUSE, INCOME MAXIMIZATION TYPE, and LIVELIHOOD TYPE on intentions about farm exit. Therefore, null hypothesis H03 is rejected, and it can be concluded that farming conditions make a significant difference in intentions about farm exit.

Fourth, multiple mediation effect analyses were conducted to investigate whether farm exit barriers (EAS FXB) mediated between the personal characteristics of old farmers and intentions about farm exit (Hypothesis 4). The results showed that farm exit barriers mediate between INCOME MAXIMIZATION TYPE and intentions about farm exit and between LIVELIHOOD TYPE and intentions about farm exit. Therefore, null hypothesis H04 is rejected, and it can be concluded that farm exit barriers make a significant difference in intentions about farm exit.

Finally, multiple mediation effect analyses were conducted to investigate whether there was

offset among the mediation effects of farming conditions (ATR FRM), farm exit policy (EFF FXP), and farm exit barriers (EAS FXB) (Hypothesis 5). The results showed that farming conditions and farm exit barriers cancel the mediation effect of farm exit policy between INCOME MAXIMIZATION TYPE and intentions about farm exit. Therefore, null hypothesis H05 is rejected. In conclusion, farming conditions and farm exit barriers reduce the effect of farm exit policy.

Table 7.12 Results showing direct and indirect effects of personal characteristics on farm exit of old farmers

Independent variables	Direct Effect	Mediators	Specific Indirect Effect (Uncontrolled)	Specific Indirect Effect (Controlled)	Total Indirect Effect
HELP	(-)*	ATR FRM	(+)	(+)	(-)
		EFF FXP	(-)	(+)	
		EFF COP	(-)	(-)	
		EFF RDP	(-)	(+)	
		EAS FXB	(-)	(-)	
SPOUSE	(-)*	ATR FRM	(-)*	(-)*	(-)
		EFF FXP	(-)	(-)	
		EFF COP	(+)	(+)	
		EFF RDP	(+)	(-)	
		EAS FXB	(+)	(-)	
LIVELIHOOD TYPE	(-)*	ATR FRM	(-)*	(-)*	(-)*
		EFF FXP	(-)	(-)	
		EFF COP	(-)*	(-)*	
		EFF RDP	(-)*	(+)	
		EAS FXB	(-)*	(-)*	
INCOME MAXIMIZATION TYPE	(-)*	ATR FRM	(-)*	(-)*	(-)*
		EFF FXP	(+)	(+)	
		EFF COP	(-)*	(-)*	
		EFF RDP	(-)*	(+)	
		EAS FXB	(-)*	(-)*	

Note: (1) ATR FRM (Attractiveness of farming), EFF FXP (Effectiveness of farm exit policy), EFF COP (Effectiveness of competitiveness policy), EFF RDP (Effectiveness of rural development policy), EAS FXB (Easiness of exit barrier elimination) (2) "" means the relationship is significant at 95% significance level (3) Signs of "+" ("-") in parentheses indicates the relationship is positive (negative).

These results do not mean that farm exit policy is totally ineffective, because the result is about differences in intentions about farm exit among old farmers. Nonetheless, it is thought that farm exit policy does not facilitate the farm exit of older farmers. As is seen in Section

7.3.3.1, old farmers are generally negative about farm exit policy, and some old farmers are even negative about the increase in subsidy provided by the early farm exit program (Personal communications, February 23 to March 5, 2009). This shows that the farm exit of old farmers will not be greatly affected by farm exit policy, irrespective of the size of any subsidy. And, as was seen in Section 7.3.4.3, farm exit policy does not affect intentions about farm exit, and the effect of farm exit policy is reduced by competitiveness policy and rural development policy. Furthermore, old farmers in Korea intend to continue farming until they can no longer physically manage to farm. This is because they want to secure their farmland; they want to have farming as a stable income source, due to the difficulty of getting a non-farm job and their fears of a shortage of income after retirement; and they want to be independent of their children (Section 7.3.3.3). These circumstances also make farm exit policy less effective.

CHAPTER 8

CONCLUSION AND IMPLICATIONS

8.1 Introduction

> *"The agricultural sector has played a crucial role in Korean economic development in that it has provided a plentiful supply of labour to new industries. However, as this labour drew mainly on younger people who migrated to urban centres, there has been a corresponding deterioration in the demographic structure in the agriculture sector, a break-up of traditional rural communities, and severe labour shortages in rural areas." (OECD, 2008:14). "In spite of policy reforms to facilitate structural adjustment, the average farm size has only increased from 0.94 hectare in 1975 to 1.43 hectare in 2005. At the same time, the average age of farmers has been increasing; currently, about 30% of farmers are more than 65 years old." (OECD, 2008:p.26).*

Agricultural structural change, such as farm entry and farm exit due to economic development (Diakosavvas, 1993) and trade liberalization (Murray et al., 2004; Chavas, 2001; Rehber, 2000), has been a common feature of OECD countries (Alston et al., 1995). And in the process of agricultural structural adjustment, agricultural structural adjustment policy was established to solve agricultural and rural problems like low productivity and high production costs (Antón, 2008; Blandford and Hill, 2006; Boehlje, 1999; Alston et al., 1995). The main goal of this policy was to make agricultural structure more competitive and more efficient (Happe, 2004). Under these circumstances, agricultural structure has been widely studied by Weston and Whatman (2008), Blandford and Hill (2005), Rozelle and Swinnen (2004), and

Huffman and Evenson (2001).

> *". . . farm exits—and farm entries—may play an important role in introducing technologies and productivity growth . . . Older, exiting farmers tend to downsize their operations and disinvest as they age. Farms absorbing their land, either recent entrants or surviving farms, are more likely to use newer technology and a more efficient mix of capital and labor." (Horpe and Korb, 2006: p.2).*

Farm entry and exit, intergenerational change, is noticeable structural change (Ahearn et al., 2002), because farm entry and exit contributes not only to the stability of family farms (Giraud, 2004; Errington 2001; Kimhi and Lopez, 1997; Kimhi, 1994; Bohlje, 1973) and the sustainability of rural communities (Lobley, 2010; Gale, 2003; Pietola et al., 2003) but also to the profitability and competitiveness (Weston and Whatman, 2008; Gale, 2003; Pietola et al., 2003; Ehrensaft et al., 1984; Bollman and Steeves, 1982) of the farming industry. Therefore, facilitation of farm entry and exit has been one of the main objectives of agricultural structural adjustment policy (Happe, 2004).

Despite the importance of the relationship between agricultural structural adjustment policy and farm entry and exit, as described above, research studies on the effect of agricultural structural adjustment policy on farm entry and exit are scarcely to be found, although the association between the demographic and socio-economic characteristics of farmers and farm entry and exit (Väre, 2006; Rossier and Weiss, 2006; Glauben et al., 2003; Pietola et al., 2003; Kimhi and Nachlieli, 2000; Stiglbauer and Weiss, 2000; Kimhi and Bollman, 1999) and the migration of rural people between economic sectors and between regions (Stark and Lucas, 1988; Stark, 1982; Todaro, 1969) are found in research studies, as was discussed in Sections 2.2 to 2.4. Furthermore, the problems of how agricultural structural adjustment policy affects

farm entry and exit, as well as the behavioral mechanisms of prospective farmers and old farmers which lead to farm entry and exit, have also scarcely been dealt with in previous studies (Section 2.6).

As was seen in Section 2.4, most research studies on farm entry or farm exit or farm transfer have identified factors which affect farm entry and exit and their relationship. As a result, it was argued that the demographic and socio-economic characteristics of farmers like age, amount of schooling, farming career, number in family, and farmland size affect it, although there are counter-arguments (Section 2.4). In addition to these, not only the economic and social conditions of farming but also farm entry and exit barriers were found to affect it (Kang, 2004; Ahn, 2001). On the basis of the research results, although some researchers argue that government can facilitate the farm exit of old farmers by lowering the upper age limit of eligibility for the early farm exit program, because old people are tending to continue farming as they get older (Väre, 2006; Pietola et al., 2003), they have not explicitly investigated the effects of agricultural structural adjustment policy on farm entry and exit.

Agricultural structural adjustment policy, which is divided into farm entry policy, farm exit policy, competitiveness policy, and rural development policy (Section 3.4), has been implemented in many countries, including Korea, although the priorities vary from country to country (Section 3.5). Farm entry and exit policy has become a particularly important concern for the government in Korea since the 1990s, because the policy is expected to facilitate intergenerational farm transfer, although poor farming conditions and farm entry and exit barriers like shortage of funds have obstructed it (MAF, 1991), as was discussed in Section 3.3.4.2.

Despite the Korean government's pursuit of an agricultural structural adjustment policy since

the 1990s, the number of young farmers has decreased and the number of old farmers has increased (Section 3.2). Given this circumstance, some researchers (Lee, 2007; Lim and Cho, 2004; Ahn et al., 2003) have argued that agricultural structural adjustment policy cannot affect farm entry and exit, which is the opposite argument to that of Kim (2007) (Section 1.1). Accordingly, the following research question is raised.

Why does agricultural structural adjustment policy not stop the trend towards an increase of old farmers and a decrease of young farmers?

I argue that the personal characteristics of prospective (old) farmers, incompatibility between farm entry policy (farm exit policy), competitiveness policy, and rural development policy, farming conditions, and farm entry barriers (farm exit barriers) restrict the effects of farm entry policy (farm exit policy) (Section 1.2), causing agricultural structural adjustment policy to fail. Following the above arguments, five hypotheses were formulated in Section 1.2.

To verify those hypotheses, this research adopted the theories of relationship between attitude and behavior (Section 6.5.2.1) as well as the relationship between farmers' personal characteristics and farm entry and exit (Section 2.4). The research theorized that farmers' personal characteristics affect their attitude to farm entry and exit, that is, their attitude to farming conditions, attitude to agricultural structural adjustment policy (farm entry and exit policy, competitiveness policy, and rural development policy), and attitude to farm entry and exit barriers, which in turn affect farm entry and exit, as well as the latter being directly affected by the personal characteristics of farmers (Section 6.5.2.1 and Section 6.5.2.2).

The relationships between personal characteristics, attitudes to agricultural structural adjustment policy, attitudes to farming conditions, attitudes to farm entry and exit barriers,

and farm entry and exit were represented in a multiple mediation effect analysis model in which the personal characteristics of farmers were the independent variables, attitudes to agricultural structural adjustment policy, attitudes to farming conditions, and attitudes to farm entry and exit barriers were the mediators, and farm entry and exit were the dependent variable (Figure 6.1 and Figure 6.2). The relationships were investigated using Hayes' Macro (2009) (Section 6.7.3.3).

The following sections present conclusions about the research questions based on verification of the research hypotheses, plus the implications for theory and practice, and the contributions, limitations, and recommendations for further research. These are explained in three different sections. The five hypotheses are verified by analyzing the direct and indirect effects of the personal characteristics of prospective farmer and old farmers on farm entry and exit through attitudes to farming, attitudes to agricultural structural adjustment policy (farm entry policy and exit policy, competitiveness policy, and rural development policy) and attitudes to farm entry and exit barriers. Then, the research question is addressed on the basis of the findings from the investigations (Section 8.2.1 and Section 8.2.2). Second, the theoretical and practical implications for farm entry and exit are discussed, focusing on relationships between demography, the socio-economic characteristics of prospective and old farmers, agricultural structural adjustment policy, and farm entry and exit. Some strategies for designing and implementing more effective farm entry and exit policies are also suggested (Section 8.3.1 and Section 8.3.2). Finally, the contribution of this research to research on farm entry and exit is discussed (Section 8.4.1) and the limitations of the research (Section 8.4.2) are used to highlight the opportunities for future research in this field (Section 8.4.3).

8.2 Findings

In this section, five hypotheses are verified, and the results are discussed in connection with findings from previous research. Then, the research question is addressed on the basis of the results of the verification of hypotheses. The case of farm entry of prospective farmers is explained first and, following that, the case of farm exit of old farmers is explained.

8.2.1 Farm entry

8.2.1.1 Research method

A survey research method was adopted for this research (Section 6.6.2). Three hundred and ninety-seven students were sampled by cluster sampling (Section 6.5.7.2) for the research. Data was collected by in-person interviews using a structured questionnaire and open-ended interviews. The questionnaire (Section 6.5.5.1 and Appendix C.1) was divided into three parts: the first was to measure demographic and socio-economic characteristics (independent variables) and type (Section 5.3.1.3); the second was to measure attitudes to farming, attitudes to agricultural structural adjustment policy, and attitudes to farm entry barriers (mediators); and the third was to measure the likelihood of farm entry after graduation (dependent variable). Of the data, both demographic and socio-economic characteristics and the likelihood of farm entry were measured by nominal scale, and attitudes to farming conditions, attitudes to agricultural structural adjustment policy, and attitudes to farm entry barriers were measured by interval scale using a five-point Likert scale (Section 6.5.4). The result is described in Section 6.3.2 and Section 6.3.3.1. Data were analyzed by multiple regression analysis, binary logistic regression analysis, and bootstrapping (Section 6.7.3.3).

8.2.1.2 Results of the verification of hypotheses

Hypothesis 1

A binary logistic regression analysis was conducted to analyze the effects of prospective farmers' personal characteristics on farm entry. In this, the independent variables were 27 dummy variables which represented 11 demographic and socio-economic characteristics of prospective farmers and type, and the dependent variable was whether or not farm entry would take place (Section 7.2.4.2).

The results showed that the birth place of prospective farmers was not associated with farm entry, which means that the probability of farm entry by rural born prospective farmers is as low as that of urban born young people. Accordingly, null hypothesis H01 is rejected, and agricultural structural adjustment policy, which is intended to make rural born young people engage in farming, is ineffective.

In addition, the results provided the following information. COUNTY (parents' farming place) and FARMING PREFERENCE TYPE (type), among other items affect farm entry. To be more precise, prospective farmers whose parents do farming in a county (COUNTY) area are less likely to do farming than those whose parents do farming in an urban area, which supports the theory that non-economic factors affect farm entry (Kang, 2004). And prospective farmers who belong to the FARMING PREFERENCE TYPE are more likely to do farming than those who belong to the NON-FARM JOB PREFERENCE TYPE, which supports the theory that interest in farming affects farm entry (Rossier and Wyss, 2006). However, the other variables, like farming experience and number of sibling, are not associated or conditionally associated with farm entry.

Although this research does not verify the effect of size of parents' income on farm entry, the fact that larger-scale farming households have a better rate of securing successors (farming size/ratio of farm household which secured successors in 2005: up to1ha/2.92%, 1-2ha/4.19%,

2-3ha/4.85%, 3ha-/5.77%) supports the theory that economic factors like size of income (Gasson et al., 1988) and size of farmland (Rossier and Wyss, 2006) affect farm entry.

Of the personal characteristics of prospective farmers, the two variables discussed above (COUNTY and FARMING PREFERENCE TYPE) are entered as independent variables in the following mediation effect analyses.

Hypothesis 2

A multiple mediation effect analysis was conducted to determine whether attitudes to farm entry policy, competitiveness policy, and rural development policy mediate between the personal characteristics of prospective farmers and farm entry, as well as to determine the offset between them. The independent variables were COUNTY and FARMING PREFERENCE TYPE, the mediators were attitudes to farm entry policy, attitudes to competitiveness policy and attitudes to rural development policy, and the dependent variable was farm entry. The results were shown in Section 7.2.4.3.

First, farm entry policy mediates between COUNTY and farm entry and between FARMING PREFERENCE TYPE and farm entry. This means that COUNTY and FARMING PREFERENCE TYPE affect farm entry through farm entry policy, and differences in the probability of farm entry between those groups and reference groups is partly due to farm entry policy.

Second, competitiveness policy does not mediate between COUNTY and farm entry or between FARMING PREFERENCE TYPE and farm entry, which means that COUNTY and FARMING PREFERENCE TYPE are not associated with farm entry through competitiveness policy. Therefore, competitiveness policy in itself does not make a significant difference to

farm entry.

Third, rural development policy also does not mediate between COUNTY and farm entry or between FARMING PREFERENCE TYPE and farm entry, which means that COUNTY and FARMING PREFERENCE TYPE do not affect farm entry through rural development policy. Therefore, rural development policy in itself does not make a significant difference to farm entry.

Finally, competitiveness policy cancels the mediation effect of farm entry policy between COUNTY and farm entry and between FARMING PREFERENCE TYPE and farm entry. This indicates that there is offset between farm entry policy and competitiveness policy, and therefore competitiveness policy reduces the effect of farm entry policy.

In conclusion, only farm entry policy makes a significant difference to farm entry by prospective farmers, and competitiveness policy cancels the effect of farm entry policy. Therefore, null hypothesis H02 is rejected, and it can be concluded that although neither competitiveness policy nor rural development policy hinders farm entry by prospective farmers, competitiveness policy reduces the effect of farm entry policy.

Hypothesis 3

A multiple mediation effect analysis was conducted to verify the mediation effect of attitudes to farming conditions between the personal characteristics of prospective farmers and farm entry. The independent variables are COUNTY and FARMING PREFERENCE TYPE, the mediator is attitude to farming, and the dependent variable is farm entry (Section 7.2.4.4).

The results show that attitude to farming does not mediate the relationship between COUNTY and farm entry. This means that COUNTY directly affects farm entry but it does not indirectly

affect farm entry through attitude to farming. And attitude to farming also does not mediate the relationship between FARMING PREFERENCE TYPE and farm entry. This means that only FARMING PREFERENCE TYPE directly affects farm entry.

Therefore, null hypothesis H03 is adopted, and it can be concluded that farming conditions do not hinder farm entry by prospective farmers.

Hypothesis 4

A multiple mediation effect analysis was conducted to verify the mediation effect of attitudes to farm entry barriers between the personal characteristics of prospective farmers and farm entry, where the independent variable was COUNTY and FARMING PREFERENCE TYPE, the mediator was attitudes to farm entry barriers, and the dependent variable was farm entry (Section 7.2.4.5).

The results showed that attitudes to farm entry barriers do not mediate the relationship between COUNTY and farm entry or that between FARMING PREFERENCE TYPE and farm entry. This means that COUNTY and FARMING PREFERENCE TYPE do not indirectly affect farm entry through farm entry barriers.

Therefore, null hypothesis H04 is adopted, and it can be concluded that farm entry barriers do not hinder farm entry by prospective farmers.

Hypothesis 5

A multiple mediation effect analysis was conducted to verify offset between the mediation effects of attitudes to farm entry policy, attitudes to farming conditions and attitudes to farm entry barriers between the personal characteristics of prospective farmers and farm entry. The

independent variables were COUNTY and FARMING PREFERENCE TYPE, the mediators were attitudes to farm entry policy, attitudes to farming conditions, and attitudes to farm entry barriers, and the dependent variable was farm entry (Section 7.2.4.6).

The results showed that the signs of the mediation effects of the three mediators were the same. This means that there is no offset between farm entry policy, farming conditions, and farm entry barriers. Therefore, null hypothesis H05 is adopted, and it can be concluded that farming conditions and farm entry barriers do not cancel the effects of farm entry policy.

8.2.1.3 Conclusions about the research question

The Korean government has pursued its agricultural structural adjustment policy since the 1990s in order to facilitate the farm entry of rural born young people, but the number of young farmers has decreased despite the policy.

So, why does agricultural structural adjustment policy not stop this trend? Answers to this question are as follows.

First, the answer can be found in the characteristics of prospective farmers, for example, their birth place. As was seen in the verification of Hypothesis 1 (Section 7.2.4.2), the probability of farm entry was not significantly greater for rural young people than for urban young people, and many prospective farmers from both types of area do not want to be engaged in farming (Section 7.2.3.3). Given this finding, it is not an effective objective for agricultural structural adjustment policy to try and make rural young people stay in farming, although the Korean government has endeavored to prevent out-migration of rural young people and to guide them towards farming by establishing agricultural schools in rural areas and providing farming set-up expenses. In fact, the probability of farm entry for prospective farmers whose parents farm

in rural areas is lower than that for prospective farmers whose parents farm in an urban area, which also makes it ineffective for agricultural structural adjustment policy to try and make rural young people stay in farming in rural areas. Furthermore, only about 23% of prospective farmers belong to the farming preference type (see Section 7.2.2 and Section 5.3.1.3), which also reduces the effect of agricultural structural adjustment policy on farm entry, since it is the farming preference type of prospective farmer, rather than the non-farm job preference type, that has a higher probability of farm entry (Section 7.2.4.2).

Second, the problem of agricultural structural adjustment policy itself, that is its ineffectiveness, as well as its incompatibility with farm entry policy and competitiveness policy, is another answer to our question. The number of new farm entrants has gradually decreased (Section 4.2.1.2) since the 1990s, and the ratio of younger prospective farmers aged 20-30 to total farm entrants has also decreased (MAF, 2008), although the government has positively intervened to try and make young people do farming through farm entry policy (Section 3.4.2.2). And, although the government has endeavored to lessen the income gap between farm households and urban wage earner households and the gap in the quality of life between rural areas and urban areas, using agricultural structural adjustment policy to this end since the 1970s (Section 3.3.3.2), the income gap gradually has increased (Figure 4.6) and the gap in living conditions has not decreased (MAF, 2004), the latter being estimated as another cause of out-migration of rural young people. As is seen in the open-ended interview data (Section 7.2.3.3), many prospective farmers do not want to be engaged in farming, due to less favorable conditions of farming like low farming income and poor living conditions in rural areas. In addition, as was seen in Section 7.2.4.3, competitiveness policy cancels out the effect of farm entry policy. This means that competitiveness policy has reduced the effect of farm entry policy on the farm entry of prospective farmers, due to incompatibility between farm

entry policy and competitiveness policy.

Finally, from a macro-economic point of view, another answer can be found in the fact that farm entry is affected more by labor market conditions than by government intervention. As was seen in Section 4.2.1, the number of new farm entrants who have started farming with the help of the agricultural structural adjustment policy has not increased (Figure 4.1), and the policy was also not associated with the number of young farmers aged under 35 (Section 4.2.2.3). In addition, farm households' terms of trade (Figure 4.7) as well as the income ratio between farm households and urban wage earner households (Figure 4.6) have not affected it and, similarly, it has been found that farming conditions do not affect farm entry (Section 7.2.4.4). The only significant variables were labor market related variables like the unemployment rate (Figure 4.8) and the number of employed persons (Figure 4.9). These indicate that the number of young farmers aged under 35 is not affected by farming conditions and government policy but by non-farm job opportunities in other industries. This is shown in the comment of a prospective farmer: "Who do you think wants to be a farmer? It would be strange to want to be engaged in farming in these circumstances. I think any kind of non-farm job is better than farming." (High school student, personal communication, between 23 February 2009 and 5 March 2009). All these findings suggest that agricultural structural adjustment policy is inadequate for facilitating farm entry under these circumstances.

8.2.2 Farm exit

8.2.2.1 Research method

A survey research method (Section 6.6.3) was adopted. Three hundred and sixty-seven old people who were chosen by judgment sampling (Section 6.5.7.3) participated in this research.

Data was collected by in-person interviews using a structured questionnaire (Section 6.5.5.2 and Appendix C.2) and open-ended interviews (Section 7.3.3.3). The questionnaire was divided into three parts according to the kinds of data required: one part was devised to measure demographic and socio-economic characteristics (independent variables) and type (Section 5.3.2.3); another was devised to measure attitudes to farming, attitudes to agricultural structural adjustment policy, and attitudes to farm exit barriers (mediators); and the third part was devised to measure whether farm exit was likely or not (dependent variable). Of the data, demographic and socio-economic characteristics and whether farm exit was likely or not were measured by nominal scale, and attitudes to farming, attitudes to agricultural structural adjustment policy, and attitudes to farm exit barriers were measured by interval scale, using the five-point Likert scale. The results are described in Sections 7.3.2 and 7.3.3.1.

8.2.2.2 Results of the verification of hypotheses

Hypothesis 1

A Binary logistic regression analysis was conducted to investigate whether the personal characteristics of old farmers, such as age, affect farm exit, where the independent variables were 38 dummy variables which represented 12 categorical variables and type, and the dependent variable was farm exit (Section 7.2.4.2).

The results showed that the personal characteristics of old farmers do not affect farm exit. And when farm exit was proxied by intention to exit farming, age was not associated with farm exit either. Therefore, null hypothesis H01 is rejected, and it can be concluded that there is no significant relationship between age and farm exit, which restricts the effect of a farm exit policy intended to induce older farmers to exit farming.

So, why age does not affect farm exit? According to Kimhi and Bollman (1999), the loss of their capacity for physical labor and unexpected accidents cause old farmers to exit from farming, and this finding can be applied to the case of Korea. That is, old farmers exit farming only when they cannot continue due to physical problems (Section 7.3.3.3).

From open-ended interviews (Section 7.3.3.3), it was found that three out of four people who decided to exit farming indicated that physical injury or loss of labor due to the decease of a spouse were motives for farm exit. In addition to these, the conventions of life in rural areas could be evidence which supports this phenomenon. In particular, old farmers think that they have to keep occupied in order to maintain their health. And whilst they can get a small amount of money as long as they do farming, many of them are likely to be in financial difficulty if they retire from farming, because they cannot get a non-farm job.

Those personal characteristics of old farmers that affect intentions about farm exit are: whether farmers have a spouse or not (SPOUSE); whether farmers get help from their children or not (HELP); and whether they belong to two particular types (LIVELIHOOD TYPE and INCOME MAXIMIZATION TYPE). In particular, old farmers who farm with their spouses or whose children help them have less intention of exiting farming than others, and old farmers who belong to the LIVELIHOOD TYPE and INCOME MAXIMIZATION TYPE have less intention of exiting farming than LEISURE PREFERENCE TYPE. But the other variables, like farming income and off-farm income, do not affect intentions about farm exit or conditionally affect intentions about farm exit. Therefore, the above four variables which affect farm exit were entered as independent variables in the following mediation effect analyses.

Hypothesis 2

A multiple mediation effect analysis was conducted to verify whether attitudes to farm exit policy, attitudes to competitiveness policy, and attitudes to rural development policy mediate between the personal characteristics of old farmers and farm exit, as well as whether there is offset between them. The independent variable was SPOUSE, HELP, LIVELIHOOD TYPE, and INCOME MAXIMIZATION TYPE in turn; the mediators were attitudes to farm exit policy, attitudes to competitiveness policy, and attitudes to rural development policy; and the dependent variable was intentions about farm exit. The results were as follows (Section 7.2.4.3).

First, farm exit policy does not mediate the effects of HELP, SPOUSE, LIVELIHOOD TYPE, and INCOME MAXIMIZATION TYPE on intentions about farm exit, which indicates that farm exit policy does not contribute to intentions about farm exit.

Second, competitiveness policy partially mediates the relationship between LIVELIHOOD TYPE and intentions about farm exit and between INCOME MAXIMIZATION TYPE and intentions about farm exit. Specifically, LIVELIHOOD TYPE and INCOME MAXIMIZATION TYPE are more positive about farming conditions than LEISURE PREFERENCE TYPE, which in turn means they have less intention of exiting farming. Therefore, competitiveness policy lessens the intention to exit farming of LIVELIHOOD TYPE and INCOME MAXIMIZATION TYPE. But it does not mediate between HELP and intentions about farm exit or SPOUSE and intentions about farm exit.

Third, rural development policy does not mediate the effect of HELP, SPOUSE, LIVELIHOOD TYPE, or INCOME MAXIMIZATION TYPE on intentions about farm exit,

which indicates rural development policy does not lessen the intention to exit farming.

Finally, competitiveness policy cancels the mediation effect of farm exit policy between INCOME MAXIMIZATION TYPE and intentions about farm exit. And rural development policy also cancels the mediation effect of farm exit policy between LIVELIHOOD TYPE and intentions about farm exit.

In conclusion, farm exit policy does not make a significant difference to the intentions about farm exit of old farmers, and the effect of farm exit policy is canceled by competitiveness policy and rural development policy. Therefore, the null hypothesis H02 is rejected, and it can be concluded that farm exit policy does not contribute to farm exit, and competitiveness policy and rural development policy reduce the effect of farm exit policy.

Hypothesis 3

A multiple mediation effect analysis was conducted to investigate whether attitudes to farming mediate between the personal characteristics of old farmers and farm exit. The independent variables were SPOUSE, HELP, LIVELIHOOD TYPE, and INCOME MAXIMIZATION TYPE in turn; the mediator was attitudes to farming; and the dependent variable was intentions about farm exit (Section 7.2.4.4).

The results show that attitudes to farming mediate between SPOUSE and intentions about farm exit, between LIVELIHOOD TYPE and intentions about farm exit, and between INCOME MAXIMIZATION TYPE and intentions about farm exit. This means that SPOUSE, LIVELIHOOD TYPE, and INCOME MAXIMIZATION TYPE affect intentions about farm exit through attitudes to farming. Specifically, SPOUSE, LIVELIHOOD TYPE, and INCOME MAXIMIZATION TYPE have less intention of exiting farming, which is partly

because of their attitudes to farming. Accordingly, null hypothesis H03 was rejected, and it can be concluded that attitudes to farming contribute to the intensification of intention to exit farming, in that the signs of the mediation effects of SPOUSE, INCOME MAXIMIZATION TYPE, and LIVELIHOOD TYPE are consistent with those of the direct effects.

Hypothesis 4

A multiple mediation effect analysis was conducted to verify whether attitudes to farm exit barriers mediate between the personal characteristics of old farmers and intentions about farm exit, where the independent variable was SPOUSE, HELP, LIVELIHOOD TYPE, and INCOME MAXIMIZATION TYPE in turn, the mediator was attitude to farm exit barriers, and the dependent variable was intentions about farm exit (Section 7.2.4.5).

The results showed that attitudes to farm exit barriers partially mediate between LIVELIHOOD TYPE and intentions about farm exit and between INCOME MAXIMIZATION TYPE and intentions about farm exit. This means that the two types are more positive towards farm exit barriers than LEISURE PREFERENCE TYPE, which in turn means they have less intention of exiting farming.

Therefore, null hypothesis H04 is rejected, and it can be concluded that farm exit barriers contribute to an intensification of intention to exit farming, in that the signs of the mediation effect of farm exit barriers are consistent with those of the direct effects of those types.

Hypothesis 5

A multiple mediation effect analysis was conducted to verify whether attitudes to farming and attitudes to farm exit barriers offset the effect of farm exit policy, where the independent variable was SPOUSE, HELP, LIVELIHOOD TYPE, and INCOME MAXIMIZATION

TYPE in turn, the mediators were attitudes to farm exit policy, attitudes to farming, and attitudes to farm exit barriers, and the dependent variable was intentions about farm exit (Section 7.2.4.6).

The results showed that attitudes to farming and attitudes to farm exit barriers cancel the mediation effect of farm exit policy between INCOME MAXIMIZATION TYPE and intentions about farm exit.

Therefore, null hypothesis H05 is rejected, and it can be concluded that attitudes to farming conditions and attitudes to farm exit barriers reduce the effect of farm exit policy.

8.2.2.3 Conclusion about the research question

The Korean government has pursued an agricultural structural adjustment policy since the 1990s, in order to induce old farmers to exit farming. But the number of old farmers has increased.

So, why does agricultural structural adjustment policy not stop the trend towards an increase in the number of old farmers? The answers are as follows.

First, the reason can be found in one of the characteristic of old farmers: age. As was seen in the verification of Hypothesis 1 (Section 7.3.4.2), age is not associated with intentions about farm exit, which means that the intention to exit farming does not increase as farmers get older. And according to the result of a comparison of the ratios of farm retirees by age (Section 4.3.2.2), there was also no significant difference in the probability of farm exit between age groups. Given this finding, the effect of farm exit policy, which is intended to induce older farmers to exit from farming, cannot help but be limited. Furthermore, livelihood type (Section 5.3.2.3), a category of farmers who have to continue farming until they cannot

do farming work any more, includes about 67% of farmers (Section 7.3.2). This also restricts the effect of agricultural structural adjustment policy on the farm exit of old farmers. Old farmers also tend to continue farming as for long as they can to get income, secure family farms, and be independent of their children (Section 7.3.3.3), another factor that makes agricultural structural adjustment policy less effective.

Second, the inconsistency between farm exit policy, competitiveness policy, and rural development policy is another reason for the ineffectiveness of farm exit policy. As was seen in the verification of Hypothesis 2 (Section 7.3.4.3), farm exit policy does not mediate between the personal characteristics of old farmers and intentions about farm exit, which means that it does not contribute to farm exit. And old farmers do not agree that the early farm exit program facilitates the farm exit of old farmers (Section 7.3.3.1). This also supports the argument that farm exit policy is ineffective. In addition, the number of farm retirees has decreased since 1997 (Section 4.3.2.1), despite the government's positive intervention to induce old farmers to exit farming (Section 3.4.2.3). And the incompatibility between farm exit policy, competitiveness policy, and rural development policy also restricts the effect of farm exit policy. As was seen in Section 7.3.4.3, the effect of farm exit policy is canceled by competitiveness policy or rural development policy, which reduces the effect of farm exit policy.

Third, it was proved that, from a macro-economic point of view, the number of old farmers aged 60 and over was not significantly associated with the number of farmers who retired from farming with the help of farm exit policy. Nor was it associated with farm households' terms of trade and income ratio between farm households and urban wage earner households (Section 4.3.3.3). This indicates that agricultural structural adjustment policy and the

economic conditions of farming do not affect farm exit. The only significant variable was farm population per farm household, that is, old farmers do not quit farming but continue farming even if their spouses or children do not help them. This is supported by the fact that old farmers tend to do farming until they cannot physically do it any more with the help of mechanization, help from younger farmers in their villages, and mutual cooperation between old farmers, even though their children or their spouses cannot help them due to out-migration or decease (Section 7.3.3.3). "Young farmers in my village help with farming work, and old people work for each other in turn. Furthermore, mechanization makes farming easier, especially in rice farming. So it is easier to farm nowadays than in times past, and old farmers can easily cultivate one hectare of farmland." (Old farmer, personal communication, between 23 February, 2009 and 5 March, 2009)

Finally, farming conditions and farm exit barriers reduce the effect farm exit policy. As was seen in the verification of Hypothesis 5 (Section 7.3.4.6), the effect of farm exit policy is canceled by the effect of farming conditions and farm exit barriers, which means that the effect of farm exit policy is restricted by farming conditions and farm exit barriers.

8.3 Implications for theory and practice

On the basis of this research and previous research studies, this section highlights implications for farm entry and farm exit theories as well as the implementation of agricultural structural adjustment policy. The cases of farm entry by prospective farmers and farm exit by old farmers are explained in turn, and farm transfer at national level is the final item to be explained.

8.3.1 Farm entry

8.3.1.1 Implications for theory

Although research on the effect of the personal characteristics of prospective farmers on farm entry are scarcely to be found (Section 2.4), this research demonstrates that the personal characteristics of prospective farmers, except for type, are not factors which significantly affect farm entry.

The demographic and socio-economic characteristics of prospective farmers, for example grade in agricultural high school, sex, sibling ranking, birth place, major subject of study, and parent's job – but with the exception of the location of parents' farms – were not significant determinants of farm entry, although some characteristics, like the number of sibling, parents' farming produce, and some kinds of farm entry barriers, conditionally affected farm entry (Section 7.2.4.2), which is consistent with the argument of Kim and Ma (2005). Although the relationship between farming income and farm entry was not investigated in this research, farming size was positively related to the ratio of farmers who were successful in securing successors (Section 5.2.3.2), which is consistent with the argument of Rossier and Wyss (2006), Hennessy (2002), and Gasson et al. (1988).

Meanwhile, type is a significant factor that predicts farm entry (Section 7.2.4.2), and this supports the validity of type in predicting behavior (Shultz and Shultz, 2008; Ryckman, 2004; Carver and Scheier, 2000; Lastovicka and Joachimsthaler, 1988) in farm entry study. Although there was no significant difference in farm entry between the risk averse type and the non-farm job preference type of farmer, this does not mean that the risk averse type and non-farm job preference type are not distinct from each other. Rather, it seems that the risk averse type feels that current farming conditions are not attractive, as the non-farm job preference type does, and this is the reason why there was no significant difference in farm

entry between them.

Second, this research also shows that attitudes to farming conditions and farm entry are not significantly related to each other, which supports the argument of Rossier and Wyss (2006), although there have been some arguments that attitudes to farming conditions are positively related to farm entry (Gale, 2003; Ganpat and Bholasingh, 1999; Willock et al., 1999).

Third, it was shown that farm entry policy contributes to the farm entry of prospective farmers, although competitiveness policy and rural development policy do not contribute to it. It can be said that agricultural policy, in the form of farm entry policy, affects farm entry (Mishara and El-Osta, 2008; Grant, 2006) according to this research, but this research also shows that the effect of agricultural policy on farm entry is dependent on the particular kind of agricultural policy, and there is offset between farm entry policy and competitiveness policy (Section 7.2.4.3).

Finally, this research shows that farm entry barriers do not hinder farm entry (Section 7.2.4.5). Although Gale (2003) argued that farm entry barriers discourage prospective farmers from engaged in farming, this research shows a different result. The difference can be explained as follows. Even if a kind of farm entry barrier affects farm size or the point in time at which farming is entered, it does not critically affect prospective farmers' decisions on whether to enter farming or not. For example, although prospective farmers struggle with shortage of funds, they can start farming in a small way, rather than not doing farming at all.

8.3.1.2 Implications for practice

How can the farm entry of prospective farmers be facilitated? And how can agricultural structural adjustment policy, especially farm entry policy, be made a more effective way of

facilitating the farm entry of prospective farmers? The result of this research has some practical implications for this objective.

According to interviews with high school teachers (personal communications, between February 23, 2009 and 5 March, 2009), about five out of each hundred students who graduate from agricultural high schools are estimated to enter farming annually. And as demonstrated in Section 7.2.4.2, intentions to enter farming in third grade were not higher than those in first and second grade. These results mean that agricultural education is not a very effective measure for encouraging prospective farmers to do farming. Further, if the majority of prospective farmers in agricultural schools do not wish to be engaged in farming, like the non-farm job preference type, as was seen in Section 7.2.3.3, farm entry policy intended to eliminate farm entry barriers like shortage of funds will not facilitate farm entry, even if it helps prospective farmers who have already decided to do farming. Given this, one way of guaranteeing greater effectiveness for farm entry policy could be to influence young agricultural students who belong to the other types to belong to the farming preference type, because personality is not finalized, and it can be changed, although there are arguments about the stability and mutability of personality (Clark, 2009; Robins et al., 2001), and further study is needed in this field.

This research also implies that the offset effect of competitiveness policy on the farm entry of prospective farmers should be considered when designing or implementing agricultural structural adjustment policy. For example, although competitiveness policy does not directly aim to affect farm entry, it could have the opposite effect to that of farm entry policy, which is seen in the case of FARMING PREFERENCE TYPE and COUNTY (Section 7.2.4.3). Therefore, the government has to consider whether or not competitiveness policy or rural

development policy could have a negative effect on farm entry when designing agricultural structural adjustment policy. And the government also has to investigate which factors of these policies could negatively affect farm entry by consulting prospective farmers, and those factors should be eliminated or minimized to improve the effectiveness of farm entry policy.

Finally, the government has to give extra support to less favored rural areas, because otherwise prospective farmers will find it preferable to settle in urban areas rather than in county areas – as is suggested by the fact that prospective farmers whose fathers do farming in urban areas are more likely to do farming themselves (Section 7.2.4.2). From this point of view, a balanced national development policy in Korea, including, for example, public sector relocation, is expected to indirectly contribute to farm entry by developing less favored rural areas. And policy measures to improve the living, educational, and cultural infrastructure in less favored areas in the agricultural sector (Section 3.3.4) are also expected to contribute to the farm entry of prospective farmers.

8.3.2 Farm exit

8.3.2.1 Implications for theory

First, this research shows that the demographic and socio-economic characteristics of old farmers are not significant factors which affect farm exit in Korea, which is not always consistent with the results of previous studies in other countries (Section 2.4.2), even though the difference could be partly explained by difference in nationality (Section 2.4.4.)

The results (Section 7.3.4.2) are inconsistent with the arguments that farmers' age (Väre, 2006; Pietola et al., 2003; Kimhi and Nachlieli, 2000; Stiglbauer and Weiss, 2000; Kimhi and Bollman, 1999), off-farm income (Väre, 2006; Glauben et al., 2003; Goetz and Debertin,

2001; Stiglbauer and Weiss, 2000; Kimhi and Bollman, 1999), kinds of farm produce (Glauben et al., 2003; Pietola et al., 2003; Stiglbauer and Weiss, 2000; Kimhi and Bollman, 1999), and number of children or family members (Stiglbauer and Weiss, 2000; Kimhi and Bollman, 1999) affect farm exit. However, this research supports the argument that formal education (Stiglbauer and Weiss, 2000), farming experience (Väre, 2006), farming income (Väre, 2006), farming location (Rossier and Weiss, 2006; Väre, 2006), and off-farm income (Glauben et al., 2003; Kimhi and Bollman, 1999) do not affect farm exit. Meanwhile, variables which are related to the farming labor force, like whether there is a spouse or not (SPOUSE) and whether there is help from children or not (HELP), affect intentions about farm exit, which supports the argument of Kimhi and Bollman (1999).

Type among the characteristics of old farmers is an influential variable which predicts intentions about their farm exit (Section 7.3.4.2). As in the case of farm entry (Section 7.2.4.2), type proves to be a valid predictor of behavior (Shultz and Shultz, 2008; Ryckman, 2004; Carver and Scheier, 2000; Lastovicka and Joachimsthaler, 1988) in farm exit study.

Second, this research also demonstrates that the effect of the personal characteristics of old farmers on farm exit is partly due to agricultural structural adjustment policy (Section 7.3.4.3) or farming conditions (Section 7.3.4.4) or farm exit barriers (Section 7.3.4.5). For example, LIVELIHOOD TYPE and INCOME MAXIMIZATION TYPE have less intention of exiting farming than LEISURE PREFERENCE TYPE, which is partly because these groups of old farmers feel farming is more attractive, and they feel the elimination of farm exit barriers to be easier (Section 7.3.4.4).

Third, this research has proved that competitiveness policy contributes to the lessening of intention to exit farming by LIVELIHOOD TYPE and INCOME MAXIMIZATION TYPE,

but neither farm exit policy nor rural development policy contributes to intention to exit farming (Section 7.3.4.3). This implies that the effect of agricultural policy on farmers (Mishara and El-Osta, 2008) can be better understood by subdividing the policy.

Finally, there is offset between farm exit policy, competitiveness policy, and rural development policy (Section 7.3.4.3), although agricultural structural adjustment policy is intended to induce old farmers to exit farming. The effect of farm exit policy is restricted by competitiveness policy or rural development policy; and it is also restricted by farming conditions and farm exit barriers (Section 7.3.4.6).

8.3.2.2 Implications for practice

How can farm exit policy induce old farmers to give up farming earlier? One of the purposes of research which investigates the farm exit of old farmers is to find a way of facilitating farm exit for them (Väre, 2006; Pietola et al., 2003). Using a farmers' early retirement scheme from Finland and the direct payment for farmland transfer program in Korea as a means of facilitating the farm exit of old farmers, this research gives some implications for designing more effective programs.

In Korea, the government has changed the eligible age for the direct payment for farmland transfer program twice: in 2004 and 2007. But raising or lowering the upper or lower age limits of eligibility for this program are not an effective strategy, as Väre (2006) and Pietola et al. (2003) argue, because age is not associated with either exiting farming or having the intention to exit (Section 7.3.4.2). The government would do better to help old farmers who transfer their farmland to keep working after retirement: old farmers do not want to quit working, because of their need to maintain good health and adequate finances (Section

7.3.3.3). From this point of view, a better way of facilitating farm exit would be to permit old farmers to transfer part of their farmland, so that they can still do farming after retirement. In addition to this, an increase in the subsidy for farmland transfer could be considered as a way of facilitating the farm exit of old farmers, because old farmers feel that the current levels of subsidy are too low (Section 7.3.3.3). But this would not necessarily facilitate farm exit (Section 7.3.3.1), because off-farm income and intentions about farm exit are not significantly associated with each other (Section 7.3.4.2).

This research also implies that the unexpected effects of competitiveness policy and rural development policy on farm exit should be considered if farm exit policy is to be made more effective, because competitiveness policy and rural development policy cancel the effect of farm exit policy (Section 7.3.4.3). Farm exit policy is not a factor which makes a difference in old farmers' intentions about farm exit, but competitiveness policy contributes to differences in intentions about farm exit (Section 7.3.4.3). To be precise, competitiveness policy delays farm exit by farmers who belong to the LIVELIHOOD TYPE and INCOME MAXIMIZATION TYPE, because it contributes to a lessening of their intention to exit farming (Section 7.3.4.3). By contrast, rural development policy could facilitate the farm exit of LIVELIHOOD TYPE and INCOME MAXIMIZATION TYPE, because it has an opposite effect when combined with farm exit policy (Section 7.3.4.3). All this shows that the effect of farm exit policy cannot easily be estimated, which implies that farm exit policy can fail if policy makers put their trust in the positive effects of the financial incentives of farm exit policy, like subsidy for farmland transfer, without considering the effects of other relevant polices.

In addition to these considerations, the effect of farm exit barriers should be also weighed in

the balance. Contrary to normal expectations that farm exit barriers delay farm exit (Pushkarskaya and Vedenov, 2009), helping old farmers overcome farm exit barriers is not likely to guarantee their earlier farm exit, because old farmers who find farm exit barriers easier to overcome have less intention of exiting farming (Section 7.3.4.5). And government policy that seeks to stabilize the off-farm income of old farmers, such as the old age pension support program and the farmers' pension support program, are not likely to make old farmers exit farming earlier, because intentions about farm exit and the size of off-farm income are not directly associated with each other (Section 7.3.4.2). These considerations imply a possible failure of policy, with positive government intervention to eliminate farm exit barriers actually resulting in a delay to farm exit.

Finally, as was seen above, farm exit policy is inadequate to facilitate farm exit when account is taken of offset between farm exit policy, competitiveness policy and rural development policy (Section 7.3.4.3) and old farmers' dependence on farming (Section 7.3.3.3). However, it is to be expected that farm exit policy could be more effective by changing LIVELIHOOD TYPE or INCOME MAXIMIZATION TYPE into LEISURE PREFERENCE TYPE, although ways of doing this were not studied in this research, and there is still argument about the possibility of changing personality (Section 8.3.1.2).

8.3.3 Farm transfer: implications for practice

One of the concerns which attracts the interest of government is the cause of delay in farm transfer between generations (Mieke, 2009). The increase in the average age of the farming population has been an important agricultural and rural problem, and it has been thought to be due to an imbalance between farm entry and farm exit (Carbone and Subioli, 2008). So, why is it that farm transfer between generations is delayed in Korea? Is it because old farmers are

delaying farm exit? Or is it because young people hesitate to become engaged in farming? And how is farm transfer to be facilitated? Although this research has dealt with farm entry and farm exit separately, it has indicated some possibilities for improving farm transfer between generations at national level.

According to interviews with prospective farmers (Section 7.2.3.3), many of them do not want to do farming due to the less favorable conditions of farming, like low income and the inferior living conditions of rural areas. And old farmers seem to intend to continue farming until physical failings prevent them from farming any longer (Section 7.3.3.3). According to the life cycle theory (Gale, 1994; Kimhi, 1994; Boehlje, 1992), old farmers will exit farming due to physical problems as time goes on. This is true to some extent, because old farmers have to exit farming when they cannot do farming work anymore. But it has been proved that age is not associated with farm exit (Section 7.4.3.2). And as the development of medical technology and better nutrition increase the average age of the population, mechanization decreases the physical burden of farming. Both of these reduce the effect of age on farm exit.

Thus we see that the cause of delay in farm transfer is the delay of farm exit as well as the delay of farm entry, and it is not likely that farm transfer will become smoother as time goes on in Korea. Moreover, it seems to be difficult to facilitate farm transfer through government policy, because farm exit policy is proved not to contribute to farm exit (Section 7.3.4.3), although farm entry policy does contribute to farm entry by prospective farmers (Section 7.2.4.3).

Meanwhile, regional differences in farm entry are the other factor which should be considered when dealing with the problem of delay of farm transfer, because there could be an imbalance in farm transfer between developed and under-developed areas, in that young people in

developed areas have a higher probability of farm entry (Section 7.2.4.2).

Accordingly, a strategy which separately approaches the problems of delay in farm entry and delay in farm exit without considering regional differences is not thought to be effective in facilitating farm transfer between generations. On the contrary, this research implies that the problems of farm entry and farm exit should be simultaneously solved to facilitate farm transfer between generations, and different measures for farm entry and farm exit should be applied to different regions, rather than the same measures for farm entry and exit being applied in different regions. This also implies that local governments have to play a leading role in facilitating farm transfer if there are to be regional differences in farm transfer.

8.4 Contributions, limitations, and recommendations for further study

8.4.1 Contributions

Why does agricultural structural adjustment policy not stop the trend towards a decrease in the number of young farmers and an increase in the number of old farmers? Although there has been plenty of research on farm entry and farm exit, little of it has been conducted to investigate the effect of agricultural structural adjustment policy on farm entry and farm exit (Section 2.4), despite the fact that agricultural structural adjustment policy has been seen as one of the means of delivering much needed structural change, that is, increased farm entry and farm exit (Section 1.1). In addition, the effect of agricultural structural adjustment policy on farm entry and exit was only anticipated from a theoretical point of view in Korea (Section 1.1). Therefore, this research fills a gap in the literature by showing a way of modeling as well as empirically investigating the effects of agricultural structural adjustment policy on farm entry and farm exit. As a result, this research shows that agricultural structural adjustment

policy does not work due to the characteristics of farmers (Section 7.2.4.2 and Section 7.3.4.2), farming conditions (Section 7.3.4.6), and farm exit barriers (Section 7.3.4.6), as well as the ineffectiveness of agricultural structural adjustment policy (Section 4.2.2.3, Section 4.3.3.3, Section 7.2.3.1, Section 7.3.3.1, and Section 7.3.4.3) and incompatibility between farm entry policy and farm exit policy, competitiveness policy, and rural development policy (Section 7.2.4.3 and Section 7.3.4.3).

Another contribution is that a novel concept, the different types of farmer (Section 5.3.1.3 and Section 5.3.2.3), was introduced by applying personality theory (Section 5.2.1). Although the relationship between personality traits and behavior is disputed (Monson et al., 1982), and the idea of predictability in the behavior of particular types is even criticized by researchers (Furnham and Crump, 2005; Pittenger, 1993), this research has empirically proved that type in farmers is a significant factor which predicts their behavior, that is, their farm entry and farm exit (Section 7.2.4.2 and Section 7.3.4.2).

Finally, this research has proved that the theory of relationship between attitude and behavior (Section 6.5.2.1) is effective. Although there have been arguments about whether attitude and behavior are directly related or not (Section 6.5.2.1), this research shows that the two are directly related in our study of farm entry and farm exit.

8.4.2 Limitations

The first limitation of this research comes from the scope of its application, which is mainly due to diverse combinations between farm entry and farm exit, like farm exit with transfer between generations and farm exit without succession. Although this research provides a broad understanding of farm entry and farm exit at national level (Section 8.3.3), it has

investigated farm entry and farm exit separately, and therefore the results cannot be directly applied to the case of farm transfer of family farms. Transfer of farms between family members could be a special case, in that it requires simultaneous agreement between family members, as well as requiring that farm entry and exit take place at the same time.

This research adopted a survey method (Section 6.4.3) and used statistical techniques, like multiple regression analysis (Section 6.7), which were useful to discover possible relationships between variables and verify these. But, from a methodological point of view, this research also has two weak points.

The major weakness is that the sampling methods used in this research may limit the extent to which the results can be generalized (Section 6.5.7.1). In the case of prospective farmers, the cluster sampling method (Section 6.5.7.2) adopted to select the sample could be more biased than simple random sampling. And in the case of old farmers, the judgment sampling method adopted (Section 6.5.7.3) could also have problems which limit the extent to which the sample can be considered representative, although I tried to sample people who were representative according to the criteria of income, age, and farming produce (Section 6.5.7.3). Of the 345 prospective farmers in the sample, the majority (78%) were agricultural high school students who were not interested in farming. This is likely to have made these prospective farmers' attitudes to farming, farm entry policy, competitiveness policy, rural development policy, farm exit barriers, and farm entry (Section 7.2.3.1) less positive. In addition to these, data from open ended interviews (Section 7.2.3.3 and Section 7.3.3.3) were used to explain farm entry and farm exit, which also limits the extent to which the research can be generalized.

The second problem relates to multicollinearity, and arises from the statistical techniques used in this research, like regression analysis. There is necessarily a problem of multicollinearity in

a multiple meditation effect analysis model (Kenny, 2008). Specifically, if a predictor is significantly associated with a mediator, this relationship affects the accuracy of estimates of the other regression coefficient between mediators and a dependent variable.

8.4.3 Recommendations for further research

This research produced novel results on the role of farmers' personal characteristics, agricultural structural adjustment policy, farming conditions, and farm entry and exit barriers in farm entry and exit (Section 7.2.4 and Section 7.3.4). However, there still exist uncovered areas which need additional research, and the present research also has some limitations (Section 8.4.2). Based on these, the following suggestions are made for further study on farm entry and farm exit.

First, as has already been discussed in Section 6.5.7, the representativeness of the sample is an important concern in research, due to the question of the extent to which the results of the research can be generalized. In particular, the selection of a sampling method is critical to the kind of research to which an investigation into farm entry and exit at national level belongs. Accordingly, it would be useful to conduct another piece of research of the same kind adopting a less biased sampling method.

Second, studies on the dynamic process of farm transfer which takes place in the regions of Korea are expected to contribute to further understanding of farm entry and exit. The farm entry of prospective farmers and farm exit of old farmers can take place simultaneously or separately. For example, old farmers can retire from farming by transferring farmland to family members or by transferring farmland to other farmers or without transferring farmland to other people at all. And young people can start farming by succeeding to their parents'

farmland or buying land from other farmers. Meanwhile, farm entry and farm exit can be studied at farm household level, regional level, and national level. Although this research could be applied to farm transfer at regional level (Section 8.3.3), it cannot reflect the full dynamic farm transfer process at regional level because it investigated farm entry and farm exit separately.

Finally, this research showed that type is a significant factor which affects farm entry and exit, but the concept of type was only briefly introduced here (Chapter 5). Therefore, further studies are needed to conceptualize type in more detail, and to develop methods to measure it in greater detail, or to find factors which affect the formation of type, or to investigate the possibility of inducing a change of type.

BIBLIOGRAPHY

Abott, P., 2003. Agricultural trade liberalization and adjustment in developing countries. Paper presented to Workshop on agricultural policy reform and adjustment, 23-25 October 2003 Imperial College, London.

ADAS Consulting Ltd, University of Plymouth, Queen's University Belfast, and Scottish Agricultural College, 2004. *Entry to and exit from farming in the United Kingdom.* Wolverhampton: ADAS Consulting Ltd, report to Department for Environment, Food and Rural Affairs, London.

Ahearn, M., Yee, J., and Huffman, W., 2002. The impact of government policies on agricultural productivity and structure: preliminary results. Paper prepared for presentation at the American Agricultural Economics Association Meeting, 28-31 July 2002 Long Beach, California.

Ahmad, A., 2008. Experiences with agricultural structural adjustment: Indonesia. Paper presented to APEC Agricultural Technical Cooperation Working Group, Sharing experiences of structural adjustment policies in the agricultural sector, 12-14 March 2008 Sydney, Australia.

Ahn, D.H., 2003. *A study of agricultural human resources.* Suwon, Kyounggido: Korea National College of Agriculture. (In Korean.)

An, D.H. and Kim, K.S., 2004. Factors influencing farmers' exit decisions. *Korean journal of agricultural economics,* 452, 163-185.

Ajzen, I., 2005. *Attitudes, personality and behavior*. 2nd ed. Chicago, IL: Dorsey.

Ajzen, I., 1991. The theory of planned behavior. *Organizational behavior and human decision processes,* 50, 179-211.

Ajzen, I., 1985. From intentions to actions: a theory of planned behavior. *In:* J. Kuhl, and J. Beckman, eds. *Action-control: from cognition to behavior*. Heidelberg: Springer, 11-39.

Ajzen, I. and Cote, N. G., 2008. Attitudes and the prediction of behavior. *In*: W. D. Crano and R, Prislin, eds. *Attitude and attitude change.* New York: Psychology Press.

Alston, M.J., Chalfant, A.J., and Pardey, G.P., 1995. Technical progress and structural change in OECD agriculture. *In*: R.S. Tabor. *Agricultural research in an era of adjustment: policies, institutions, and progress*. Washington, DC: The World Bank.

Antón, J., 2008. OECD views on adjustment policies. Paper presented to APEC Agricultural Technical Cooperation Working Group, Sharing experiences of structural adjustment policies in the agricultural sector, 12-14 March 2008 Sydney, Australia.

Bai, W., Hao, J., Zhang, Q., and Guo, W., 2007. Impacts of policy related to structural adjustment of agriculture on grain supply in China. *International journal of sustainable*

development and world economy, 14, 287-298.

Bailey, K., 2007. *Methods of social research*. 4th ed. New York: The Free Press

Balmann, A., 1997. Farm-based modelling of regional structure change: a cellular automata approach. *European review of agricultural economics*, 24 (1), 85-108.

Barkley, A.P., 1990. The determinants of the migration of labor out of agriculture in the United States, 1940-1985. *American journal of agriculture economics*, 72 (3), 567-573

Baron, R. M. and Kenny, D. A., 1986. The moderator–mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *Journal of personality and social psychology*, 51, 1173-1182.

Bascou, P., Londero, P., and Münch, W., 2004. Reform and adjustment in the European Union: the 2003 reform of the common agricultural policy and enlargement. Paper presented to International Agricultural Trade Research Consortium, Adjusting to domestic and international agricultural policy reform in industrial countries, June 6-7 2004 Philadelphia, PA.

Becker, G.S., 1962. Investment in human capital: a theoretical analysis. *The journal of political economy*, 75 (5), 9-49.

Becker, G.S. and Murphy, K.M., 1988. The family and the state. *Journal of law and economics*, 31 (1), 1-18.

Bedeski, R.E., 1992. *The transformation of South Korea: reform and reconstruction in the Sixth Republic under Roh Tae Woo, 1987-1992*. London: Routledge.

Bennett, J.A., 2000. Focus on research methods. Mediator and moderator variables in nursing research: Conceptual and Statistical Differences. *Research in Nursing and Health*, 23, 415~420.

Bernard, H.R., 2000. *Social research methods: qualitative and quantitative approaches.* Newbury Park, CA: Sage.

Bhatia, K.B., 1979. Rural-urban migration and surplus Labour. *Oxford economics papers*, New series, 31 (3), 404-413.

Biggs, B., Murray, P., Dubman, R., Erickson, K., and Korb, P., 2004. Recent changes in farm structure: a Canada-U.S. comparison. *The Canadian journal of agricultural economics*, 5, 95-107.

Blaikie N., 2003. *Analysing quantitative data.* London: Sage.

Blanc, M. and Perrier-Cornet, P., 1993. Farm transfer and farm entry in the European Community. *Sociologia ruralis*, 33 (3-4), 319-335.

Blandford, D. and Boisvert, R., 2006. Policies affecting resource and adjustment in agriculture in the European Union. *In:* D. Blandford and B. Hill, eds. *Policy reform and adjustment in the agricultural sectors of developed countries.* Oxford: CAB International,

Blandford, D. and Boisvert, R.N., 2004. U.S. policy for agricultural adjustment. Paper presented to the International Agricultural Trade Research Consortium, Adjusting to domestic and international agricultural policy reform in industrial countries, 6-7 June 6-7 2004 Philadelphia, PA.

Blandford, D. and Hill, B., 2005. Facilitating farm-level adjustment to the reform of trade and agricultural policies. *Trade policy issues*, Paper 4, October 2005, The International Agricultural Trade Research Consortium.

Blau, D.M., 1998. Labor force dynamics of older married couples. *Journal of labor economics*, 16 (3), 595-629.

Blau, D.M., and Riphahn, R.T., 1999. Labor force transitions of older married couples in Germany. *Labour economics*, 6 (2), 229-251.

Boehlje, M., 1999. Structural changes in the agricultural industries: How do we measure, analyze and understand them? *American journal of agricultural economics*, 81 (5), 1028-1041.

Boehlje, M., 1992. Alternative models of structural change in agriculture and related industries. *Agribusiness*, 8 (3), 219-231.

Boehlje, M.D. and Eisgruber, L.M., 1972. Strategies for the creation and transfer of farm estate. *American journal of agricultural economics*, 54 (3), 461-472.

Boehlje, M., 1984. The microdynamics of structural changes in agriculture: discussion. *American journal of agricultural economics*, 66 (5), 846-84.

Boehlje, M., 1973. The entry-growth-exit process in agriculture. *Southern journal of agricultural economics*, 51(1), 23-36.

Bollman, R. and Steeves, A.D., 1982. The stocks and flows of Canadian census farm operators, 1966-7. *Canadian review of sociology and anthropology*, 19, 576-590.

Bordens, K.S. and Abbott, B.B., 1991. *Research design and methods: a process approach*. 2nd ed. California: Mayfield.

Bouckaert, G. and Halligan, J., 2006. Performance and performance management. *In:* B.G. Peters and J. Pierre, eds. *Handbook of public policy.* London: Sage.

Boyer, G.R. and Smith, R.S., 2001. The development of the neo-classical tradition in labor economics. *Industrial and labor relations review,* 54 (2), 199-223.

Bryman, A., 2001. *Social research methods.* New York: Oxford University Press.

Burger, J.M., 1993. *Personality*. 3rd ed.. Pacific Grove, CA: Brooks/Cole.

Burmeister, L.L., 1990. South Korea's rural development dilemma: trade pressures and agricultural sector adjustment. *Asian survey*, 30 (7), 711-723.

Buttel, H.F. and Gertler, E. M., 1981. Agricultural structure, agricultural policy, and

environmental quality: some observations on the context of agricultural research in North America. *Agriculture and environment,* 7, 101-119.

Cahill, C. and Hill, B., 2006. Policies affecting resources adjustment in agriculture in the European Union. *In: Blandford, D. and Hill, B., eds. Reform and adjustment in the agricultural sectors of developed countries*. MA: CABI publishing.

Carbone, A. and Subioli, G., 2008. The generational turnover in agriculture: the ageing dynamics and the EU support policies to young farmers. Paper prepared for the 109th EAAE Seminar, The CAP after the Fischler reform: national implementations, impact assessment and the agenda for future reforms, 20-21 November 2008 Viterbo, Italy.

Cargan, L., 2007. *Doing social research.* Maryland: Rowan and Littlefield.

Carver, C.S. and Scheier, M.F., 2000. *Perspectives on personality*. 4th ed. Boston: Allyn and Bacon.

Caskie, P., Davis, J., Campbell. D., and Wallace, M., 2002. *An Economic study of farmer early retirement and new entrant schemes for Northern Ireland*. Belfast: Queens University.

Chavas, J-P., 2001. Structural change in agricultural production: economics, technology and policy. *In:* B.L. Gardner and G.C. Rausser, eds. *Handbook of agricultural economics pp.* 263-285. Amsterdam: Elsevier.

Chadwick, B.A., Bahr, H.M., and Albrecht, S.L., 1984. *Social science research methods.* New Jersey: Prentice Hall.

Champion, D.J., 1981. *Basic statistics for social research*. 2nd ed. Pennsylvania: Chandler.

Chaplin, H., Davidova, S., and Groton, M., 2004 Agricultural adjustment and the diversification of farm households and corporate farms in Central Europe. *Journal of rural studies,* 20, 61-77.

Cho, Y.H. and Joh, J.J., 1980. Urbanizing the rural economy of Korea: central government policies to develop industries in rural areas. A paper delivered at the Second International Conference on Asian Urbanization, 8-14 August 1988 Nanjing University, China.

Choi, M.H. and Park, D.B., 1993. A survey on the farm successor situation in Korea. *Journal of Korean agricultural education,* 25 (4), 1-8. (In Korean.)

Clark, L.A., 2009. Stability and change in personality disorder. *Current directions in psychological science,* 18 (1), 27-31.

Cong, T.V. and Minh, N.A., 2008. Experiences with agricultural structural adjustment: Vietnam. Paper presented to APEC Agricultural Technical Cooperation Working Group, Sharing experiences of structural adjustment policies in the agricultural sector, 12-14 March 2008 Sydney, Australia.

Conger, A.J., 1974. A revised definition of suppressor variables: a guide to their identification and interpretation. *Educational and psychological measurement,* 34, 35-46.

Corbetta, P., 2003. *Social research: theory, methods and techniques.* London: Sage.

Crano, D.W. and Brewer, I..M., 2002. *Principles and methods of social research.* New Jersey: Lawrence Erlbaum Associates.

Creswell, J.W., 2003. *Research design. Qualitative, quantitative and mixed methods approaches.* Newbury Park, CA: Sage.

David, M. and Sutton, D.C., 2003. *Social research: the basics.* London: Sage.

Diakosavvas, D., 1993. Structural adjustment and farm employment. *OECD Observer.*

Dillman, D.A., 1978. *Mail and telephone survey: the total design method.* New York: John Wiley.

Dooley, D., 2001. *Social research methods*. 4th ed. New Jersey: Prentice Hall.

Ehrensaft, P., LaRamee, P., Bollman, R. D., and Buttel, F. H., 1984 The micro-dynamics of farm structural change in North America: the Canadian experience and Canada-USA comparison. *American journal of agriculture and economics,* 66, 823-828.

Errington, A.J., 2001. Handing over the reins: a comparative study of intergenerational farm transfers in England, France and Canada. Paper presented 9 March 2001 at Rakuno Gakuen University, Japan.

Errington, A.J., 1993. Managing succession in the farm family business. *Farm management,* 8, 349-359.

Eysenck, H.J., 1970. *The structure of human personality*. 3rd ed. London: Methuen.

Farm transfer project. Available from: http://ruralsociology.org/annual-meeting/2005/Giraud-Baker.pdf [Accessed 1 November 2007].

Fazio, R.H., 1986. How do attitudes guide behavior? *In:* R.M. Sorrentino, and E.T. Higgins. eds, *Handbook of motivation and cognition: foundations of social behavior*. New York: Guilford Press, 204-243.

Fei, C.H., and Ranis,G.., 1961. A theory of economics development. *The American economic review*, 51 (4), 533-565.

Field, A., 2009. *Discovering statistics using SPSS*. 3rd ed. Thousand Oaks, CA: Sage.

Findeis, J.L. and Swaminathan, H., 2003. Gender and intergenerational transfer of the farm: its influence on multiple job-holding and on-farm decision among U.S. farm women. Paper prepared for presentation at the Population Association of America annual meeting, May 2003 Minneapolis.

Fishbein, M. and Ajzen, I., 1975. *Belief, attitude, intention, and behavior: an introduction to theory and research.* Reading, MA: Addison-Wesley.

Fiske, S.T., Kenny. D.A., and Taylor, S.E., 1982. Structural models for the mediation of salience effects on attribution. *Journal of experimental social psychology*, 18, 105-127.

Foltz, J., 2004. Entry, exit, and farm size: accessing an experiment in dairy price policy. *American journal of agricultural economics*, 86 (3), 594-604.

Forrest, G., 2008. Experiences with agricultural structural adjustment: New Zealand. Paper presented to APEC Agricultural Technical Cooperation Working Group, Sharing experiences of structural adjustment policies in the agricultural sector, 12-14 March 2008 Sydney, Australia.

Furnham, A. and Crump, J., 2005. Personality traits, types, and disorders: an examination of the relationship between three self-report measures. *European journal of personality*,19, 167-184.

Freedman, L.S., and Schatzkin, A., 1992. Sample size for studying intermediate endpoints within intervention trials of observational studies. *American journal of epidemiology*, 136, 1148–1159.

Gale, H.F., 2003. Age-specific patterns of exit and entry in U.S. farming, 1978-1997. *Review of agricultural economics*, 25 (1), 168-186.

Gale, H.F., 1994. Longitudinal analysis of farm size over the farmer's life cycle. *Review of agricultural economics*, 16 (1), 113-123.

Gale, H.F., 1993. Why did the number of young farm entrants decline*? American journal of agricultural economics*, 75 (1), 138-146.

Ganpat, W.G. and Bholasingh, D., 1999. Attitudes of farmers toward farming in Trinidad, *Journal of international agricultural and extension education*, 6(3), 33-38.

Gasson, R., 1986. Part time farming: strategy for survival? *Sociologia ruralis*, 24, 364-376.

Gasson, R. and Errington, A.J., 1993. *The farm family business.* Wallingford, UK: CAB International.

Gasson, R., Crow, G., Errington A., Huston, J., Marsden, T., and Winter, M., 1988. The farm as a family business: a review. *Journal of agricultural economics*, 41, 475-489.

Glauben, T., Tietje, H., and Weiss, C., 2003. Intergenerational succession on family farms: evidence from survey data. Working Paper EWP 0202, Department of Food Economics and Consumption Studies, February 2002 University of Kiel, Germany.

Girard, D.D. and Baker, J., 2005. Farm and ranch succession in a rural California county: extending the farm transfer project. Paper presented at the Annual Meeting of the Rural Sociological Society, 11 August 200 Tampa, FL.

Goddard, N., Weersing, A., Chen, K., and Turvey, C.G., 1993. Economics of structural change in agriculture. *Canadian journal of agricultural economics*, 41, 475-489.

Goetz, S.J. and Debertin, D.L., 2001. Why farmers quit: a county-level analysis. *American journal of economics*, 83 (4), 1010-1023.

Goldsmith, P. and Gow, H., 2000. Strategic positioning under agricultural structural change: a critique of long jump co-operative ventures. Prepared for the Annual Meeting of NCR-194 Regional Research Meetings on Cooperatives, 12-13 December Las Vegas, NV.

Gordon, K.M., 1989. Introduction. *European review of agricultural economics*, 15 (4), 305-308.

Grant, W., 2006. Agriculture and food. *In:* B.G. Peters and J. Pierre, eds. *Handbook of public policy*. London: Sage.

Greeen, B.S. and Salkind, J.N., 2008. *Using SPSS for Windows and Macintosh: analyzing and understanding data*. 5th ed. New Jersey: Prentice Hall.

Guba, E.G., and Lincoln, Y.S., 1994. Competing paradigms in qualitative research. *In:* N.K. Denzin and Y.S. Lincoln, eds., *Handbook of qualitative research*. London: Sage, 105-117.

Guinnane, T.W., 1992. Intergenerational transfers, emigration, and the rural Irish household system. *Explorations in economic history*, 29, 456-476.

Guither, H.D., 1963. Factors influencing farm operators' decisions to leave farming. *Journal of farm economics*, 45 (3), 567-576.

Hakim, C., 2000. *Research design: successful design for social and economic research*. 2nd ed. London: Routledge.

Happe, K., 2004. Agricultural policies and farm structures: agent-based modeling and applications to EU-policy reform. Institute of Agricultural Development in Central and Eastern Europe (IAMO), Vol. 30.

Harris, D., 2008a. Sharing experiences of structural adjustment policy in the agricultural sector: an overview of seminar outcomes. Paper presented to APEC Agricultural Technical Cooperation Working Group, Sharing experiences of structural adjustment policies in the agricultural sector, 12-14 March 2008 Sydney, Australia.

Harris, D., 2008b Structural adjustment policy in agriculture: concepts and concerns. Paper presented to APEC Agricultural Technical Cooperation Working Group, Sharing experiences of structural adjustment policies in the agricultural sector, 12-14 March 2008 Sydney, Australia.

Harris, J.R. and Todaro, M.P., 1970. Migration, unemployment and development: a two sector analysis. *The American economics review*, 60 (1),126-142.

Hayes, F.A., 2009. Macros SPSS and SAS and Script SPSS only for estimating indirect effects in simple mediation models. Available from: http://www.comm.ohio-state.edu/ahayes/sobel.htm [Accessed 7 June 2009].

Hennessy, T., 2002. Modeling succession on Irish dairy farms. Paper prepared for

presentation at the Xth EAAE congress 'Exploring diversity in the European Agri-Food System', 28-31 August 2002 Zaragoza, Spain.

Higgins, E.T., 2000. Does personality provide unique explanations for behaviour? Personality as cross-person variability in general principles. *European journal of personality*, 14, 391-406.

Hinton, R.P., 2004. *SPSS explained.* London: Routledge.

Ho, Y.M., 1972. Development with surplus population. The case of Taiwan: a critique of the classical two-sector model, a la Lewis. *Economic development and cultural change*, 20 (2), 210-234.

Honma, M. and Hayami, Y., 1989. In search of agricultural policy reform in Japan. *European review of agricultural economics,* 15 (4), 367-395.

Hoppe, R.A. and Korb, P., 2006. Understanding US farm exits. United States Department of Agriculture, Economic Research Service Economic Research, Report No. 21.

Hoyle, H.R., Harris, J.M. and Judo, M.C., 2002. *Research methods in social relations*. 7th ed.. Thomson Learning.

Hsiao, T., 2008. Experiences with agricultural structural adjustment: Chinese Taipei. Paper presented to APEC Agricultural Technical Cooperation Working Group, Sharing experiences of structural adjustment policies in the agricultural sector, 12-14 March 2008 Sydney, Australia.

Huffman, W.E. and Evenson, R.E., 2001. Structural and productivity change in US agriculture 1950-1982. *Agricultural economics*, 24 (2), 127-147.

Huh, S.H., 1993 *A new agriculture: the strategies of Korean agriculture for the 21st century.* Seoul: Kimyoungsa. (In Korean.)

Hutcheson, G. and Sofroniou, N., 1999. *The multivariate social scientist: Introductory statistics using generalized linear models*. Thousand Oaks, CA: Sage Publications.

Hwang, H.I., 2006. *Data analysis using SPSS.* Seoul: Changjisa. (In Korean.)

Isik, M., Coble, K.H., Hudson, D., and House, L.O., 2003. A model of entry-exit decisions and capacity choice under demand uncertainty. *Agricultural economics,* 28, 215-224.

James, L.R. and Brett, J.M., 1984. Mediators, moderators and tests for mediation. *Journal of applied psychology,* 69, 307-321.

Jin, K.S., 2002. A study of the development of Korea's agriculture under innovation and openness: Lessons from experiences in France and the EU. *Journal of European studies,* 7 (2), 79-122.

Johnson, B. and Christensen, L., 2007. *Educational research: quantitative, qualitative, and mixed approaches.* 3rd ed. Thousand Oaks, CA: Sage.

Johnson, B.R. and Onwuegbuzie, J.A., 2004. Mixed methods research: a research paradigm whose time has come. *Educational researcher*, 33 (7), 14-26.

Jorgenson, D.W., 1967. Surplus agricultural labour and the development of a dual economy. *Oxford economic papers, New series*, 19 (3), 288-312.

Jorgenson, D.W., 1961. The development of a dual economy. *The economic journal*, 71 (282), 309-334.

Judd, C.M., and Kenny, D.A., 1981. Process analysis: estimating mediation in treatment evaluations. *Valuation review*,5, 602-619.

Jung, M.C., Min, S.K., Moon, S.C., and Song, M.R., 1997. Agricultural structure adjustment and measures for small farmers. Seoul, Korea: Korea Rural Economic Institute. (In Korean.)

Jyung, C.Y., 1994. A study of the careers of agricultural high school graduates. *Journal of Korean agricultural education,*.26 (3), 1-19. (In Korean.)

Kang, D.K., 2004. *Strategies to promote an advanced agricultural workforce under a change of agricultural workforce structure*. Sunchon National University.(In Korean.)

Kang, H. J., 2006. Determinants of farm exit in Korea. *Journal of rural development*, 29 (4), 33-51.

Kang, H.J. and Kim, J.H., 2007. Impacts of direct income payments on productive efficiency of Korean rice farms. *Journal of rural development*, 31 (2), 1-22.

Kang, J.T., 1997. Innovative strategies in agricultural high school systems in relation to the development of farm successors. *Journal of Korean agricultural education*, 29 (1), 1-16. (In Korean.)

Keating, N. and Munro, B., 1989. Transferring the family farm: process and implication. *Family relations,* 38 (2), 215-219.

Kenny, A.D., 2009. Learn how you can do a mediation analysis and output a text description of your results. Available from: http://davidakenny.net/cm/mediate.htm [Accessed 6 June 2009].

Kim, B.T., 2002. *The agricultural policy of Korea.* Seoul: Hanul Academy. (In Korean.)

Kim, J.H., 2007. *Evaluation of agricultural policy*. Seoul, Korea: Korea Rural Economic Institute. (In Korean.)

Kim, J.H. 2004. *Rice negotiation and measures for structural adjustment of the rice farming industry*. Seoul, Korea: Korea Development Institute. (In Korean.)

Kim, J.H., 2000. Prospects for Korean agricultural policy. *Journal of rural development*, 23, 83-103. (In Korean.)

Kim, J.H., Kim, H.S., Song, M.R., and Lee, B.H.. 2006. *A monitoring and evaluation of*

agricultural policy. Seoul, Korea: Korea Rural Economic Institute. (In Korean.)

Kim, J.H., Lee, K.C., Kim, T.G., and Park, K.H., 2000. *Agriculture and rural area structural improvement projects*. White paper. Seoul, Korea: Korea Rural Economic Institute. (In Korean.)

Kim, J.H. and Ma, S.J., 2006. Attitudes towards farming of prospective farmers and beginner farmers. *Journal of agricultural education and human resource development,* 38 (1), 53-65. (In Korean.)

Kim, J.H. and Ma, S.J., 2005. *Beginner farmers' settlement and supporting policy.* Seoul, Korea: Korea Rural Economic Institute. (In Korean.)

Kim, J.H., Park, D.K., Kim, H.S., Song, M.R., and Lee, B.H., 2004. *A study of the operation of the comprehensive plan for agriculture and rural area development.* Seoul, Korea: Korea Rural Economic Institute. (In Korean.)

Kim, J.H., Park, S.D., Kim, T.G., 1999. *A fifty year history of Korean agricultural policy.* Seoul, Korea: Korea Rural Economic Institute. (In Korean.)

Kim, H.H. and Kim, J.K., 2009. Adjustment capacity of Korean farm household. Paper presented at the 111 EAAE-IAAE Seminar on Small farms: decline or persistence, 26-27 June University of Kent, Canterbury, UK.

Kim, H.H. and Lee, Y.K., 2004. Agricultural policy reform and structural adjustment in Korea and Japan. Paper presented to the International Agricultural Trade Research Consortium on adjusting to domestic and international agricultural policy reform in industrial countries, June 6-7 Philadelphia, PA.

Kim, T.H, Yoon, T.Y., and Yoon, YY., 2007. *A comparative study of Korean agriculture based on international agricultural statistics.* Seoul, Korea: Korea Rural Economic Institute. (In Korean.)

Kim, S.W. and Yu, B.M., 2003. Changes in rural society during decades of industralization. *Journal of Korean agricultural education*, 35 (4), 1-14. (In Korean.)

Kim, Y.S. and Huh, Y.J., 2008. *Understanding of farming and rural areas*. Seoul, Korea: Nonghyup economic research institute. (In Korean.)

Kimhi, A., 1994. Optimal Timing of Farm Transfer from Parent to Child. *American journal of agricultural economics,* 76 (2), 228-236.

Kimhi, A. and Bollman, R., 1999. Family farm dynamics in Canada and Israel: the case of farm exits. *Agricultural economics*, 21 (1), 69-79.

Kimhi, A. and Lopez, R., 1997. Retirement planning and succession considerations of Maryland farmers: evidence from a household survey. Paper presented at the Eleventh Annual Conference of the European Society for Population Economics.

Kimhi, A. and Nachlieli, N., 2000. Intergenerational succession in Israeli family farms.

Prepared for presentation at the 2000th Annual Meeting of ESPE, June 2000.

Kline, P., 1993. *An easy guide to factor analysis.* London: Routledge.

Knickel, K., 1990. Agricultural structural change: impact on the rural environment. *Journal of rural studies*, 64, 383-393.

Kraemer, H.C., Stice, E., Kazdin, A., Offord, D., and Kupfer, D., 2001. How do risk factors work together? Mediators, moderators, and independent, overlapping, and proxy risk factors. *The American Journal of Psychiatry,* 158, 848–56.

KREI, 1999. *A fifty year history of Korean agricultural policy.* Gwacheon, Gyounggi: Ministry of Agriculture and Forestry.

Kvale, S. and Brinkmann, S., 2008. *Interviews: learning the craft of qualitative research interviewing*. 2nd ed.. London: Sage.

Langbein, L. and Felbinger, C. L., 2006. *Public program evaluation: a statistical guide.* M.E. Sharpe.

Lastovicka, J. L. and Joachimsthaler, E.A., 1988. Improving the detection of personality-behavior relationships in consumer research. *The journal of consumer research*, 14 (4), 583-587.

Le-Bert, C.R., 2008. Experiences with agricultural structural adjustment: Chile. Paper presented to APEC Agricultural Technical Cooperation Working Group, Sharing experiences of structural adjustment policies in the agricultural sector, 12-14 March 2008 Sydney, Australia.

Lee, E.S., 1966. A theory of migration. *Demography,* 3 (1), 47-57. (In Korean.)

Lee, J.H., 2007. Issues and agricultural policy after KOR-US FTA: agricultural adjustment policy. *Journal of the GS and J institute*, 49, 1-10. (In Korean.)

Lee, K.M., 1999. Industrialization and educational expansion in South Korea. *The journal of educational development*, 9 (1), 1-31.

Lee, S.M. 1992. The problems of an agricultural policy in a transitional period: agricultural and rural area development. *Monthly report on agricultural products prices*, 119, 5-9. (In Korean.)

Leon, J.J., 2003. Survey *research: in-person, mail, telephone and web methods,* Hawaii: Streamline Surveys.

Lim, H.B. and Cho, J.K., 2004. A study of the improvement of agricultural structural adjustment programs. *Journal of Korean agricultural education*, 36 (3), pp.147-166. (In Korean.)

Lobley, M., 2010. Succession in the family farm business. *Journal of farm management*, 13 (12), 1-13.

Mackinnon, D.P., 2009. Statistical mediation. Available from: http://www.public.asu.edu/~davidpm/ripl/mediate.htm#medtests. [Accessed on 9 June 2009].

Mackinnon, D.P., 2008. *Introduction to statistical mediation analysis.* CRC Press.

Mackinnon, D.P., 2000. Contrasts in multiple mediator models. *In:* Rose et al., eds. *Multivariate applications in substance use research.* Mahwah, NJ: Lawrence Erlbaum Associates.

Mackinnon, D.P., 1994. Analysis of mediating variables in prevention and intervention research. *In:* A. Cázares and A.L. Beatty, eds. *National Institute on Drug Abuse Research.* Monograph series No.139, Scientific methods for prevention intervention research. National Institute on Drug Abuse.

MacKinnon. D.P., Fairchild, J.A. and Fritz, M.S., 2007. Mediation analysis. *Annual review of psychology*, 58, 593-614.

Mackinnon, D.P., Krull, L.J., and Lockwood, M.C., 2000. Equivalence of the mediation, confounding and suppression effect. *Prevention science*, 1 (4), 173-181.

MacKinnon, D.P., Lockwood, C.M., Hoffman, J.M., West, S.G., and Sheets,V. 2002. A comparison of methods to test mediation and other intervening variable effects. *Psychological methods*, 7, 83-104.

MAF, 2008. Data of successor farmers set up program (unpublished data). Gwacheon, Kyounggido: Ministry of Agriculture and Forestry. (In Korean.)

MAF, 2006. *A survey on living conditions in rural areas*. Gwacheon, Kyounggido: Ministry of Agriculture and Forestry. (In Korean.)

MAF, 2004. *Comprehensive plan for agriculture and rural development*. Gwacheon, Kyounggido: Ministry of Agriculture and Forestry. (In Korean.)

MAF, 1988. *Agriculture and rural development plan and 45 trillion KRW investment plan*. (Unpublished book.) Gwacheon, Kyounggido: Ministry of Agriculture and Forestry. (In Korean.)

MAF, 1981. *Agricultural structure improvement plan*. (Unpublished book.) Gwacheon, Kyounggido: Ministry of Agriculture and Forestry. (In Korean.)

Mann, S., 2007a. Tracing the process of becoming a farm successor on Swiss family farms. *Agriculture and human values*, 24, 435-443.

Mann, S., 2007b. Understanding farm succession by the objective hermeneutics method. *Sociologia ruralis*, 47 (4), 369-383.

Mann, S. and Mante,, J., 2004. *Occupational choice and structural change*. Working paper series, No.2. Available from: http://ageconsearch.umn.edu/handle/123456789/4582 [Accessed July 2004].

Maxwell, J.A., 2005. *Qualitative research design: an interactive approach*. 2nd ed. Newbury Park CA: Sage.

Maxwell, J.A. and Loomis, D., 2002. Mixed methods design: an alternative approach. *In:* A. Tashakkori, and C. Teddlie, eds, *Handbook of mixed methods in social and behavioral research*. Newbury Park, CA: Sage, 241-271.

Mcburney, D., 1994. *Research methods*. 3rd ed. California: Brooks/Cole.

McCool, D.C., 1995. *Public policy theories, models, and concepts: an anthology.* New Jersey: Prentice Hall.

McNamara, C., 1999. *General guidelines for conducting interviews.* University of Minnesota.

Mellor. J., 1999. Faster, more equitable growth: the relationship between growth in agriculture and poverty reduction. Agricultural policy development project research report No.4. Cambridge, MA: Abt Associates.

Menard, S., 1995. *Applied Logistic Regression Analysis*. Sage Publications.

Mieke, C., 2009. Factors explaining farm succession and transfer in Flanders. Thesis (PhD).Ghent University.

Miles, M.B. and Huberman, A.M., 1994. *Qualitative data analysis: an expanded sourcebook.* 2nd ed., Newbury Park, CA: Sage.

Mishara, A.K. and El-Osta, H.S., 2008. Effect of agricultural policy on succession decisions of farm households. *Revue of Economics of the Household*, 6 (3), 285-307.

MOE, 2008. *Statistical year book of education.* Gwacheon, Gyounggi: Ministry of Education and Human Resources. (In Korean.)

Molho, I., 1986. Theories of migration: review. *Scottish journal of political economy,* 33 (4), 396-419.

Monson, T.C., Hesley, J.W., and Chemick. L., 1982. Specifying when personality traits can and cannot predict behavior: an alternative to abandoning the attempt to predict single-act criteria. *Journal of personality and social psychology*, 43 (2), 385-399.

Morese, J. M. 2003. Principle of mixed methods and multimethod research design. In Tashakkori, A. and Teddlie, C. eds, *Hand book of mixed methods: in behavioral and social research*. Thousand Oaks, CA: Sage.

Morris, T., 2007. *Social work research methods: four alternative paradigms.* Newbury Park, CA: Sage.

Möllers, J., Zier, P., Frohberg, K., Buchenrieder, G. and Bojnec, S., 2009. Croatia's EU accession: socio-economic assessment of farm households and policy recommendations. Munich Personal RePEc Archive (MPRA) paper No.17365.

MPB, 1999. A analysis of the successor farmers' set up program. Seoul, Korea: Ministry of Planning and budget. (In Korean.)

MPB, 2003. A performance evaluation of the successor farmers' set up program. Report material, 5 September 2003. Seoul, Korea: Ministry of Planning and Budget. (In Korean.)

Muller, D., Judd, C.M., and Yzerbyt, V.Y., 2005. When moderation is mediated and mediation is moderated. *Journal of Personality and Social Psychology*, 89(6), 852–863.

Na, S.I., 2004. Analysis of farming status of Korea National College of Agriculture graduates. *Journal of Korean agricultural education*, 36 (4), 1-19. (In Korean.)

Neuman, W.L., 2006. *Social research methods: qualitative and quantitative approaches*. 6th ed.. Pearson, Allyn and Bacon.

Neuman, W.L., 2000. *Social research methods: qualitative and quantitative approaches*. 4th ed.. Pearson, Allyn and Bacon.

Noskova, N. and Mezhonova, N. 2008. Experiences with agricultural structural adjustment: Russian Federation. Paper presented to APEC Agricultural Technical Cooperation Working Group, Sharing experiences of structural adjustment policies in the agricultural sector, 12-14 March 2008 Sydney, Australia.

OECD 2008. *Evaluation of agricultural policy reforms in Korea*. Paris: OECD.

OECD 2003. *Agricultural policies in OECD countries: monitoring and evaluations*. Paris: OECD.

OECD 1995. *Adjustment in OECD countries: issues and policy responses.* Paris: OECD.

Osborne, J.W. and Waters, E., 2002. Four assumptions of multiple regression that researchers should always test. *Practical assessment, Research and evaluation*, 8 (2), 16-22.

O'Sullivan, E. and Rassel, G.R., 1994. *Research methods for public administrators*. 2nd ed. New York: Longman.

Park, D. S. 2004. *A Study of the economic activities and income of the rural elderly in Korea.* Seoul, Korea: Korea Rural Economy Institute. (In Korean.)

Park, D.S., Jung, M.C. and Huh, J., 2000. *Old farmers' farming intentions and development of productive welfare system*. Seoul, Korea: Korea Rural Economy Institute. (In Korean.)

Park, H.Y. and Fullerton, H.H., 1980. Rural-urban migration: the case of Korea. *The annals of regional science*, 14 (1), 72-90.

Park, M.S., 1979. *Public policy: emerging dimensions in public administration.* University Press of America.

Patton, M.Q., 2002. *Qualitative research and evaluation methods* 3rd ed.. Thousand Oaks, CA: Sage.

Peck, R., Olsen, C., and Devore, J., 2008. *Introduction to Statistics and Data Analysis.* Cengage Learning.

Penn, J.B., 1979. The structure of agriculture: an overview of the issue. *In: Structure issues of American agriculture.* Economics, statistics, and cooperatives service, agricultural report No. 438, 2-23. Washington, DC: USDA.

Pesquin, C., Kimhi, A., and Kislev, Y., 1999. Old age security and inter-generational transfer of family farms. *European review of agricultural economics*, 26, 19-37.

Pfeffer, M., 1989. Part-time farming and the stability of family farms in the Federal Republic of Germany. *European review of agricultural economics*, 16, 425-444.

Pietola, K. and Väre, M., and Lansik, A., 2003. Timing and type of exit from farming: farmers. *European review of agricultural economics*, 30 (1), 99-116.

Pittenger, D.J., 1993. Measuring the MBT I993. *Journal of career planning and employment*, 54 (1), 48-52.

Preacher, J.K., and Hayes, A.F., 2008. Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior research methods*, 40, 879-891.

Preacher, J.K. and Hayes, F.A., 2004. SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavioral research methods, instruments, and computers*, 36 (4), 717-731.

Preacher, J.K. and Leonardelli, J.G., 2009. Calculation for the Sobel test: an interactive calculation tool for mediation tests. Available from: http://people.ku.edu/~preacher/sobel/sobel.htm [Accessed 10 June 2009].

Punch, F.K., 2005. *Introduction to social research: quantitative and qualitative approaches*. 2nd ed. London: Sage.

Pushkarskaya, H. and Vedenov, D., 2009. Farming exit decision by age group: analysis of tob acco buyout impact in Kentucky. *Journal of agricultural and applied economics*, 41 (3), 653-6 62.

Ranis, G., 2004. Arthur Lewis' contribution to development thinking and policy. Economic growth center, Yale University, Center discussion paper No. 891. Available from: http://www.econ.yale.edu/~egcenter/, [Accessed 15 May 2008].

Ranis, B.G and Fei, C. H., 1961. A theory of economic development. *The American economic review*, 51 (4), 533-565.

Ranney, A., 1968. The study of policy content: a framework for choice. *In:* A. Ranney, ed., *Political science and public policy.* Chicago: Markham.

Refaat, M., 2006. *Data preparation for data mining using SAS.* Amsterdam: Elsevier.

Rehber, E., 2000. Changing agricultural structure and policies in Europe toward the twenty-first century. *The European legacy*, 5(5), 629-643.

Rhoda, R., 1983. Rural development and urban migration: can we keep them down on the farm? *International migration review,* 17 (1), 34-64.

Robins, R.W., Fraley, R.C., Roberts, B.W., and Trzesniewski, K.H., 2001. A longitudinal study of personality change in young adulthood. *Journal of personality,* 69 (4),.617-640.

Romero, A.R., 2008. Experiences with agricultural structural adjustment: Mexico. Paper presented to APEC Agricultural Technical Cooperation Working Group, Sharing experiences of structural adjustment policies in the agricultural sector, 12-14 March 2008 Sydney, Australia.

Rosenberg, M.L., 1968. *The logic of survey analysis*. New York: The Free Press.

Rosenzweig, M.R. and Wolpin, K.I., 1985. Specific experience, household structure, and intergenerational transfers: farm family land and labor arrangements in developing countries. *Quarterly journal of economics*, 100,961-987.

Rossi, P.H. and Freeman, H.E. 2003. *Evaluation: a systematic approach*. 2nd ed. London: Sage.

Rossier, R. and Wyss, B., 2006. Farm succession in Switzerland: determinants and process. Agroscope FAT Tänikon, CH-8356j Etten-Hausen, Swiss Federal Research Station for Agriculture Economics and Engineering.

Ryckman, R., 2004. *Theories of personality*. Belmont, CA: Thomson and Wadsworth.

Sajari, M.S., 2008. Experiences with agricultural structural adjustment: Malaysia. Paper presented to APEC Agricultural Technical Cooperation Working Group, Sharing experiences of structural adjustment policies in the agricultural sector, 12-14 March 2008 Sydney, Australia.

Sarris, H.A., 1987. *Agricultural stabilization and structural adjustment polices in developing countries.* FAO Economic and social development paper, No.65.

Schmitt, G., 1991. Plenary paper 2: Why is the agriculture of advanced western economies still organized by family farms? Will this still continue to be on in the future? *European review of agricultural economics*, 18 (3-4), 443-458.

Schultz, D.P. and Schultz, S.E., 2008. *Theories of personality* 9th ed. Belmont, CA: Cengage Learning.

Shrout, P.E. and Bolger, N., 2002. Mediation in experimental and non-experimental studies: new procedures and recommendations. *Psychological methods*, 7 (4), 422–445.

Singleton, A.R., Straits, C.B. and Straits, M.M., 1993. *Approaches to social research*. 2nd ed. New York: Oxford University Press.

Sitarenios, G. and Kovacs, M., 1999. Use of the children's depression inventory. *In:* E.M.

Maruish, ed.. *The use of psychological testing for treatment planning and outcomes assessment*. 2nd ed. New Jersey: Lawrence Erlbaum Associates, 267-298.

Sjaastad, L.A., 1962. The costs and returns of human migration. *The journal of political economy*, 70 (5), 80-93.

Sobel, M.E., 1982. Asymptotic confidence intervals for indirect effects in structural equation models. *In:* S. Leinhardt, ed., *Sociological methodology*. Washington, DC: American Sociological Association, 290-312.

Sobel, M. E., 1988. Direct and indirect effects in linear structural equation models. *In:* J.S. Long, ed., *Common problems/proper solutions*. 46–64. Beverly Hills, CA: Sage.

Stark. O. 1982. Research on rural-to-urban migration in LDCs: the confusion frontier and why we should pause to rethink afresh. *World development*, 10 (1), 63-70.

Stark, O. and Bloom, D.E., 1985. The new economics of labor migration. *The American economic review*, 72 (2), 173-178.

Stark, O. and Lucas, R.E.B., 1988. Migration, remittances, and the family. *Economic development and cultural change*, 36 (3), 465-481.

Seo, J.H., Choi, J.S., and Kim, J.H., 2000. An evaluation of agricultural policy and suggestions for directions in agricultural and rural development policy. Seoul, Korea: Korea Rural Economic Institute. (In Korean.)

Stiglbauer, A.M. and Weiss, C.R., 2000. Family and non-family succession in the upper-Austrian farm sector. *Cahiers d'economie et sociologie rurales,* 54 6-26.

Sudman, S., 1983. Applied sampling. *In:* P.H. Rossi, J.D. Wright, and A.N. Anderson, eds. *Handbook of survey research*. Florida: Academic Press (145-194).

Suh, J. H. 1993. Structural adjustment of Korean agriculture: government policy programs and encountering problems. *Journal of rural development*, 16, 15-40.

Sullivan, J.T., 2001. *Methods of social research.* Texas: Harcourt College Publishers.

Swinnen, J., 2004. Policy reform and agricultural adjustment in transition countries. Paper presented to International agricultural trade research consortium, Adjusting to domestic and international agricultural policy reform in industrial countries, Philadelphia, PA, 6-7 June, 2004.

Taylor, J.E. and Martin, P.L. 2001. Human capital: migration and rural population change. *In:* B.L. Gardner and G.C. Rausser, eds., *Handbook of agricultural economics*. New York: Elsevier (457-511)

Thompson, T.F. and Levine, U.D., 1997. Examples of easily explainable suppressor variables in multiple linear regression view points. *Multiple linear regression review*, 24, 11-13.

Todaro, M.P., 1969. A model of labor migration and urban unemployment in less developed

countries. *The American economic review,* 59 (1), 138-148.

Tzelgov, J. and Henik, A., 1991. Suppression situations in psychological research: Definitions, implications, and applications. *Psychological bulletin,* 109 (3), 524-536.

Väre, M., 2007. Determinants of farmer retirement and farm succession in Finland. MTT Agrifood Research Finland, Economic Research, Luutnantintie 13, FI-00410 Helsinki, Finland.

Väre, M., 2006. Spousal effect and timing of retirement. *Journal of agricultural economics,* 57 (1), 65-80.

Väre, M., 2005. Timing of the early retirement decisions of farming couples. Paper presented at the 94th EAAE Seminar From household to firms with independent legal status: the spectrum of institutional units in the development of European agriculture, 9-10 April 2005, Ashford, UK.

Väre, M., Weiss, C. R. and Pietola, K.. 2004. Should one trust a farmer's succession plan? Empirical evidence on the intention-behaviour discrepancy from Finland. MTT Economic Research, Agrifood Research Finland. Discussion Papers 2004/4.

Vedung, E., 2006. Evaluation research. *In:* B.G. Peters and J. Pierre, eds. *Handbook of public policy.* London: Sage.

Veen, H.B., Bommel, K.H.M., and Venema, G.S., 2002. Family farm transfer Europe: a focus on the financial and fiscal facilities in six European countries. Agricultural Economics Research Institute LEI, The Hague.

Voce, A., 2004. Introduction to paradigms. Available from: http://familymedicine.ukzn.ac.za [Accessed 15 March 2009].

Vogeler, I., 1989. Reviewed works: the economics of part-time job by Ruth Gasson. *Economic geography,* 65 (1), 88-90.

Yongchareon, V. and Wongchantrakarn, R., 2008. Experiences with agricultural structural adjustment: Thailand. Paper presented to APEC Agricultural Technical Cooperation.

Weinberg, E., 1983. Data collection: planning and management. *In*: P. H. Rossi, J.D. Wright, and A.B. Anderson, eds. *Handbook of survey research.* Florida: Academic press.

Weiss, C.R., 1999. Farm growth and survival: econometric evidence for individual farms in Upper Austria. *American journal of agricultural economics*, 81 (1), 103-116.

Weston, M. and Whatman, G., 2008. Structural adjustment in Austrian agriculture. Paper presented to APEC Agricultural Technical Cooperation Working Group, Sharing experiences of structural adjustment policies in the agricultural sector, 12-14 March 2008 Sydney, Australia.

Whitechurch, M., 2008. Deregulation of the Australian dairy: a case study in adjustment. Paper presented to APEC Agricultural Technical Cooperation Working Group, Sharing

experiences of structural adjustment policies in the agricultural sector, 12-14 March 2008Sydney, Australia.

Wholey J.S., Hatry, H.P, and Newcomer, K.E., 1994 Handbook of practical program evaluation. Jossey-Bass.

Williams, F. and Farrington, J., 2006. Succession and the future of farming: problem or perception? Paper presented at the The rural citizen: governance, culture and wellbeing in the 21st century at the University of Plymouth, UK.

Willock, J., 1999. Farmers' attitudes, objectives, behaviors, and personality traits: the Edinburgh study of decision making on farms. *Journal of vocational behavior*54, 5-36.

Wong, J.K. and Sheth, J.N., 1985. Explaining intention-behavior discrepancy – a paradigm. *Advances in consumer research,* 12 (1), 378-384.

APPENDIX A (TABLES)

Table A.1 Means and standard deviations of attitudes to farming of prospective farmers

Items	Frequencies					M	SD
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
1. Farming income induces me to do farming.	24 6.96%	47 13.62%	211 61.16%	48 13.91%	15 4.35%	2.95	.853
2. The quality of life in a rural area induces me to do farming.	22 6.38%	46 13.33%	193 55.94%	66 19.13%	18 5.22%	3.03	.889
3. The social status of a farmer induces me to do farming.	27 7.83%	75 21.74%	184 53.33%	47 13.62%	12 3.48%	2.83	.883
4. Farming is a worthwhile occupation to be engaged in.	17 4.93%	30 8.70%	187 54.20%	82 23.77%	29 8.41%	3.22	.901
5. I would recommend my friends to do farming.	47 13.62%	74 21.45%	162 46.96%	45 13.04%	17 4.93%	2.74	1.012
Total	137 7.94%	272 15.77%	937 54.32%	288 16.70%	91 5.28%	2.96	.852

*Note: Above items are scored following a 5 point Likert-type scale (Strongly disagree = 1, Disagree = 2, Neutral = 3, Agree = 4, Strongly Agree =5)

Table A.2 Means and standard deviations of attitudes to farm entry policy of prospective farmers

Items	Frequencies					M	SD
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
1. The successor farmer set-up program induces me to do farming.	20 5.80%	30 8.70%	202 58.55%	79 22.90%	14 4.06%	3.11	.837
2. The farming internship program induces me to do farming.	13 3.77%	54 15.65%	210 60.87%	61 17.68%	7 2.03%	2.99	.753
3. The new farmer tutoring program induces me to do farming.	17 4.93%	36 10.43%	216 62.61%	67 19.42%	9 2.61%	3.04	.774
4. The additional fund support program induces me to do farming.	17 4.93%	29 8.41%	198 57.39%	85 24.64%	16 4.64%	3.16	.831
5. Education at agricultural school induces me to do farming.	13 3.77%	31 8.99%	194 56.23%	88 25.51%	19 5.51%	3.20	.678
Total	80 4.64%	180 10.43%	1,020 59.13%	380 22.03%	65 3.77%	3.10	.652

*Note: Above items are scored following a 5 point Likert-type scale (Strongly disagree = 1, Disagree = 2, Neutral = 3, Agree = 4, Strongly Agree =5)

Table A.3 Means and standard deviations of attitudes to competitiveness policy of prospective farmers

Items	Frequencies					M	SD
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
1. Competitiveness policy induces me to do farming.	21 6.09%	41 11.88%	202 58.55%	68 19.71%	13 3.77%	3.03	.843
2. Competitiveness policy makes prospects for farming brighter.	17 4.93%	37 10.72%	183 53.04%	92 26.67%	16 4.64%	3.15	.857
3. Competitiveness policy increases farming income.	19 5.51%	33 9.57%	182 52.75%	93 26.96%	18 5.22%	3.17	.876
4. Competitiveness policy increases the attractiveness of farming.	22 6.38%	34 9.86%	221 64.06%	54 15.65%	14 4.06%	3.01	.821
5. I want to be supported by the policy.	21 6.09%	24 6.96%	182 52.75%	79 22.90%	39 11.30%	3.26	.963
Total	100 5.80%	169 9.80%	970 56.23%	386 22.38%	100 5.80%	3.13	.770

*Note: Above items are scored following a 5 point Likert-type scale (Strongly disagree = 1, Disagree = 2, Neutral = 3, Agree = 4, Strongly Agree =5)

Table A.4 Means and standard deviations of attitudes to rural development policy of prospective farmers

Items	Frequencies					M	SD
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
1. Rural development policy induces me to do farming.	24 6.96%	50 14.49%	200 57.97%	57 16.52%	14 4.06%	2.96	.867
2. Rural development policy makes prospects for farming brighter.	17 4.93%	44 12.75%	196 56.81%	69 20.00%	19 5.51%	3.08	.860
3. Rural development policy increases farming income.	14 4.06%	37 10.72%	193 55.94%	87 25.22%	14 4.06%	3.14	.815
4. Rural development policy increases the attractiveness of farming.	18 5.22%	42 12.17%	198 57.39%	78 22.61%	9 2.61%	3.05	.812
5. I want to be supported by the policy.	21 6.09%	30 8.70%	184 53.33%	76 22.03%	34 9.86%	3.21	.951
Total	94 5.45%	203 11.77%	971 56.29%	367 21.28%	90 5.22%	3.09	.749

*Note: Above items are scored following a 5 point Likert-type scale (Strongly disagree = 1, Disagree = 2, Neutral = 3, Agree = 4, Strongly Agree =5)

Table A.5 Frequencies and percentages of farm entry barriers for prospective farmers

Variables	Categories	Frequencies	Percentages	Cumulative ratios
Entry barriers	Funds	90	26.1	26.1
	Low income	84	24.3	50.4
	The social status of farmers	71	20.6	71.0
	The quality of rural life	53	15.4	86.4
	Farming skills	35	10.1	96.5
	Others	12	3.5	100.0
	Total	345	100.0	

Table A.6 Means and standard deviations of attitudes to farm entry barriers of prospective farmers

Items	Frequencies					M	SD
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
1. The above entry barrier will not discourage me from doing farming.	24 6.96%	76 22.03%	186 53.91%	51 14.78%	8 2.32%	3.11	.837
2. The entry barrier does not make me more negative about entering farming.	19 5.51%	69 20.00%	206 59.71%	42 12.17%	9 2.61%	2.99	.753
3. I will start farming even if the above barrier is not eliminated.	11 3.19%	30 8.70%	139 40.29%	133 38.55%	32 9.28%	3.04	.774
4. I am confident that I can eliminate the barrier for myself.	17 4.93%	65 18.84%	195 56.52%	55 15.94%	13 3.77%	3.16	.831
5. Non-farm jobs also have entry barriers.	24 6.96%	43 12.46%	185 53.62%	69 20.00%	24 6.96%	3.20	.823
Total	95 5.51%	283 16.41%	971 52.81%	367 20.29%	90 4.99%	3.03	.786

*Note: Above items are scored following a 5 point Likert-type scale (Strongly disagree = 1, Disagree = 2, Neutral = 3, Agree = 4, Strongly Agree =5)

Table A.7 Means and standard deviations of intentions about farm entry of prospective farmers

Items	Frequencies					M	SD
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
1. Farming is appropriate to my aptitude and capability.	45 13.04%	75 21.74%	153 44.35%	59 17.10%	13 3.77%	2.77	1.005
2. I can be successful as a farmer.	45 13.04%	89 25.80%	129 37.39%	62 17.97%	20 5.80%	2.78	1.070
3. I want to live in a rural area.	53 15.36%	68 19.71%	131 37.97%	63 18.26%	30 8.70%	2.85	1.151
4. I am preparing to be a farmer.	59 17.10%	82 23.77%	120 34.78%	59 17.10%	25 7.25%	2.74	1.148
5. I will be happy if I can be engaged in farming.	59 17.10%	63 18.26%	136 39.42%	53 15.36%	34 9.86%	2.83	1.178
Total	261 15.13%	377 21.86%	669 38.78%	296 17.16%	122 7.07%	2.79	1.236

*Note: Above items are scored following a 5 point Likert-type scale (Strongly disagree = 1, Disagree = 2, Neutral = 3, Agree = 4, Strongly Agree =5)

Table A.8 Frequencies and percentages of whether farm entry takes place or not

Variables	Categories	Frequencies	Percentages	Cumulative ratio
Farming or not	Farming	94	27.2	27.2
	Others	251	72.8	100.0
	Total	345		

Table A.9 Factor loadings and communalities of items for attitudes to farming of prospective farmers

Items	Factor loadings	Communalities
1. Farming income induces me to do farming.	.797	.635
2. The quality of life in a rural area induces me to do farming.	.788	.622
3. The social status of a farmer induces me to do farming.	.722	.522
4. Farming is a worthwhile occupation to be engaged in.	.741	.549
5. I would recommend my friends to do farming.	.753	.567
Eigenvalue	2.894	
Variance	57.888	

Table A.10 Factor loadings and communalities of items for attitudes to farm entry policy of prospective farmers

Items	Factor loadings	Communalities
1. The successor farmer set-up program induces me to do farming.	.783	.614
2. The farming internship program induces me to do farming.	.798	.637
3. The new farmer tutoring program induces me to do farming.	.841	.707
4. The additional fund support program induces me to do farming.	. 858	.737
5. Education at agricultural school induces me to do farming.	.784	.614
Eigenvalue	3.309	
Variance	66.178	

Table A.11 Factor loadings and communalities of items for attitudes to competitiveness policy of prospective farmers

Items	Factor loadings	Communalities
1. Competitiveness policy induces me to do farming.	.841	.708
2. Competitiveness policy makes prospects for farming brighter.	.871	.759
3. Competitiveness policy increases farming income.	.868	.754
4. Competitiveness policy increases the attractiveness of farming.	.806	.650
5. I want to be supported by the policy.	.790	.624
Eigenvalue	3.495	
Variance	69.902	

Table A.12 Factor loadings and communalities of items for attitudes to rural development policy of prospective farmers

Items	Factor loadings	Communalities
1. Rural development policy induces me to do farming.	.787	.619
2. Rural development policy makes prospects for farming brighter.	.822	.675
3. Rural development policy increases farming income.	.848	.719
4. Rural development policy increases the attractiveness of farming.	.734	.695
5. I want to be supported by the policy.	.768	.590
Eigenvalue	3.298	
Variance	65.956	

Table A.13 Factor loadings and communalities of items for attitudes to farm entry barriers

Items	Factor loadings	Communalities
1. The above entry barrier will not discourage me from doing farming.	.624	.390
2. The entry barrier does not make me more negative about entering farming.	.544	.296
3. I will start farming even if the above barrier is not eliminated.	.560	.313
4. I am confident that I can eliminate the barrier for myself.	.731	.535
5. Non-farm jobs also have entry barriers.	.775	.600
Eigenvalue	2.133	
Variance	42.670	

Table A.14 Factor loadings and communalities of intentions about farm entry of prospective farmers

Items	Factor loadings	communalities
1. Farming is appropriate to my aptitude and capability.	.882	.778
2. I can be successful as a farmer.	.885	.783
3. I want to live in a rural area.	.845	.714
4. I am preparing to be a farmer.	.911	.830
5. I will be happy if I can be engaged in farming.	.904	.817
Eigenvalue	3.922	
Variance	78.434	

Table A.15 Results of binary logistic regression between the characteristics of prospective farmers and whether farm entry takes place or not.

Categorical variables	Dummy variables	B	Wald	Sig.	Exp(B)
Grade	1st grade	.711	.344	.558	.491
	2nd grade	.083	.015	.902	1.087
Sex	Male	.063	.012	.914	.939
Sibling ranking	Oldest	.529	1.107	.293	.589
Birth place	City	.742	1.910	.167	2.101
Farming experience	Experienced	.092	.019	.890	1.097
Major subject	Crop	.537	.059	.808	1.711
	Livestock	.504	.269	.604	1.655
	Landscape	.571	.391	.532	1.770
	Food processing and other produce	1.098	1.971	.160	2.998
Parents' job	Farming	1.130	2.489	.115	3.095
Number of sibling (Includes themselves)	0 people	.957	.851	.356	2.603
	1 person	.928	1.168	.280	2.528
	2 people	2.522	8.006	.005	.080
	3 people	.581	.404	.525	.560
Farming produce	Livestock	3.591	16.934	.000	36.270
	Crop and livestock	.800	.695	.404	2.225
	Horticulture, landscape, and other produces	1.160	.735	.391	3.190
	Non-farming	3.445	11.965	.001	.032
Farming location	County	3.097	10.815	.001	.045
Type	Farming preference type	2.867	13.007	.000	17.586
	Risk averse type	.853	1.421	.233	2.346
Entry barrier	Skills	.768	.889	.346	2.155
	Funds	.604	.659	.417	.547
	Social status	1.117	1.646	.200	.327
	Living conditions	.143	.034	.854	1.153
	Others	5.625	4.505	.034	.004
	Constant	.614	.188	.665	.541

Note: Enter method, whether farm entry takes place or not coded as 1 for 'yes' and 0 for 'no or others'. B: un-standardized beta.

Table A.16 Means and standard deviations of attitudes to farming of old farmers

Items	Frequencies					M	SD
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
1. Farming income induces me to continue farming.	43 11.81%	208 57.14%	102 28.02%	11 3.02%	0 0.00%	2.23	.686
2. I think prospects for farming are bright.	34 9.34%	160 43.96%	152 41.76%	18 4.95%	0 0.00%	2.42	.729
3. I think a non-farm job is also physically difficult.	11 3.02%	61 16.76%	181 49.73%	110 30.22%	1 0.27%	3.08	.773
4. A rural area is convenient to live in.	15 4.12%	153 42.03%	172 47.25%	22 6.04%	2 0.55%	2.57	.695
5. A farmer's life is a happy one.	16 4.40%	154 42.31%	173 47.53%	20 5.49%	1 0.27%	2.55	.680
Total	119 6.54%	736 40.44%	780 42.86%	181 9.95%	4 0.22%	2.57	.767

*Note: Above items are scored following a 5 point Likert-type scale (Strongly disagree = 1, Disagree = 2, Neutral = 3, Agree = 4, Strongly Agree =5)

Table A.17 Means and standard deviations of attitudes to farm exit policy of old farmers

Items	Frequencies					M	SD
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
1. The direct payment program for farmland transfer strongly affects my decision on whether to exit farming or not.	25 6.87%	106 29.12%	174 47.80%	58 15.93%	1 0.27%	2.74	.816
2. An increase in subsidy would facilitate my farm exit.	26 7.14%	95 26.10%	132 36.26%	111 30.49%	0 0.00%	2.91	.917
3. The present subsidy is not insufficient for me to exit from farming.	71 19.51%	155 42.58%	86 23.63%	51 14.01%	1 0.27%	2.33	.952
4. I think the program is effective in inducing farm exit.	21 5.77%	66 18.13%	187 51.37%	84 23.08%	6 1.65%	2.97	.839
5. I hope the program continues.	15 4.12%	35 9.62%	145 39.84%	151 41.48%	18 4.95%	3.34	.870
Total	158 8.68%	457 25.11%	724 39.78%	455 25.00%	26 1.43	2.85	.941

*Note: Above items are scored following 5 point Likert-type scale (Strongly disagree = 1, Disagree = 2, Neutral = 3, Agree = 4, Strongly Agree =5)

Table A.18 Means and standard deviations of attitudes to competitiveness policy of old farmers

Items	Frequencies					M	SD
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
1. Competitiveness policy induces me to continue farming.	57 15.66%	148 40.66%	111 30.49%	47 12.91%	1 0.27%	2.42	.913
2. Without the policy, I might exit farming.	94 25.82%	182 50.00%	55 15.11%	31 8.52%	2 0.55%	2.08	.893
3. Competitiveness policy helps increase farm income.	38 10.44%	125 34.34%	143 39.29%	58 15.93%	0 0.00%	2.61	.875
4. Competitiveness policy increases the international competitiveness of Korean farming.	49 13.46%	98 26.92%	149 40.93%	68 18.68%	0 0.00%	2.65	.934
5. I want to be supported by the policy.	103 28.30%	122 33.52%	92 25.27%	43 11.81%	4 1.10%	2.24	1.027
Total	341 18.74%	675 37.09%	550 30.22%	247 13.57%	7 0.38%	2.40	.954

*Note: Above items are scored following a 5 point Likert-type scale (Strongly disagree = 1, Disagree = 2, Neutral = 3, Agree = 4, Strongly Agree =5)

Table A.19 Means and standard deviations of attitudes to rural development policy of old farmers

Items	Frequencies					M	SD
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
1. Rural development policy induces me to continue farming.	65 17.86%	167 45.88%	75 20.60%	57 15.66%	0 0.00%	2.35	.946
2. I might exit from farming without the policy.	104 28.57%	177 48.63%	52 14.29%	28 7.69%	3 0.82%	2.04	.900
3. Rural development policy helps increase farm income.	64 17.58%	138 37.91%	112 30.77%	49 13.46%	1 0.27%	2.41	.936
4. Rural development policy increases the international competitiveness of Korean farming.	104 28.57%	165 45.33%	61 16.76%	32 8.79%	2 0.55%	2.08	.921
5. I want to be supported by the policy.	140 38.46%	88 24.18%	83 22.80%	50 13.74%	3 0.82%	2.15	1.104
Total	477 26.21%	735 40.38%	383 21.04%	217 11.87%	9 0.49%	2.20	.976

*Note: Above items are scored following a 5 point Likert-type scale (Strongly disagree = 1, Disagree = 2, Neutral = 3, Agree = 4, Strongly Agree =5)

Table A.20 Frequencies and percentages of farm exit barriers

Variables	Categories	Frequencies	Percentages	Cumulative ratio
Exit barriers	Lack of successor	10	2.7	2.7
	Lack of income	229	62.9	65.7
	Lack of non-farm job opportunity	50	13.7	79.4
	Farming debt	33	9.1	88.5
	Others (Food)	42	11.5	100.0
	Total	364	100.0	

Table A.21 Means and standard deviations of attitudes to farm exit barriers

Items	Frequencies					M	SD
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
1. The above exit barrier does not discourage me from exiting farming.	39 10.71%	158 43.41%	128 35.16%	39 10.71%	0 0.00%	2.46	0.824
2. The exit barrier does not make me more passive about preparing to exit farming.	32 8.79%	174 47.80%	121 33.24%	37 10.16%	0 0.00%	2.45	0.793
3. I can exit farming even if the above barrier is not eliminated.	20 5.49%	96 26.37%	143 39.29%	105 28.85%	0 0.00%	2.91	0.876
4. I am confident that I can eliminate the barrier for myself.	44 12.09%	186 51.10%	93 25.55%	40 10.99%	1 0.27%	2.36	0.843
5. Non-farm jobs also have exit barriers.	64 17.58%	150 41.21%	101 27.75%	48 13.19%	1 0.27%	2.37	0.932
Total	199 10.93%	764 41.98%	586 32.20%	269 14.78%	2 0.11%	2.51	.878

*Note: Above items are scored following 5 point Likert-type scale (Strongly disagree = 1, Disagree = 2, Neutral = 3, Agree = 4, Strongly Agree =5)

Table A.22 Means and standard deviations of intentions about farm exit

Items	Frequencies					M	SD
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
1. I feel like exiting farming when I meet retired people.	12 3.30%	98 26.92%	119 32.69%	125 34.34%	10 2.75%	3.06	0.923
2. I want to sell or lease my farmland rather than cultivate it myself.	20 5.49%	120 32.97%	123 33.79%	93 25.55%	8 2.20%	2.86	0.936
3. I hope someone who will cultivate my farmland appears.	27 7.42%	122 33.52%	114 31.32%	97 26.65%	4 1.10%	2.80	0.952
4. Farming work is hard for me to carry out.	6 1.65%	45 12.36%	102 28.02%	139 38.19%	72 19.78%	3.62	0.990
5. I want to enjoy a life of retirement.	14 3.85%	120 32.97%	112 30.77%	111 30.49%	7 1.92%	2.94	0.929
Total	79 4.34%	505 27.75%	570 31.32%	565 31.04%	101 5.55%	3.06	.990

*Note: Above items are scored following a 5 point Likert-type scale (Strongly disagree = 1, Disagree = 2, Neutral = 3, Agree = 4, Strongly Agree =5)

Table A.23 Frequencies and percentages of whether or not farm exit takes place

Variables	Categories	Frequencies	Percentages	Cumulative ratio
Farm exit or not	Farm exit	4	1.1	1.1
	Others	360	98.9	100.0
	Total	364	100.0	

Table A.24 Factor loadings and communalities of items for attitudes to farming of old farmers

Items	Factor loadings	Communalities
1. Farming income induces me to continue farming.	.704	.495
2. I think prospects for farming are bright.	.769	.592
3. I think a non-farm job is also physically difficult.	.691	.478
4. A rural area is convenient to live in.	.760	.578
5. A farmer's life is a happy one.	. 716	.513
Eigenvalue	2.656	
Variance	53.113	

Table A.25 Factor loadings and communalities of items for attitudes to farm exit policy of old farmers

Items	Factor loadings	communalities
1. The direct payment program for farmland transfer strongly affects my decision on whether to exit farming or not.	.818	.669
2. An increase in subsidy would facilitate my farm exit.	.799	.638
3. The present subsidy is not insufficient for me to exit from farming.	.749	.562
4. I think the program is effective in inducing farm exit.	.787	.619
5. I hope the program continues.	.746	.557
Eigenvalue	3.044	
Cumulative variance	60.874	

Table A.26 Factor loadings and communalities of items for attitudes to competitiveness policy of old farmers

Items	Factor loadings	communalities
1. Competitiveness policy induces me to continue farming.	.884	.782
2. Without the policy, I might exit farming.	.795	.631
3. Competitiveness policy helps increase farm income.	.874	.763
4. Competitiveness policy increases the international competitiveness of Korean farming.	.869	.754
5. I want to be supported by the policy.	.849	.721
Eigenvalue	3.652	
Cumulative variance	73.049	

Table A.27 Factor loadings and communalities of items for attitudes to rural development policy of old farmers

Items	Factor loadings	Communalities
1. Rural development policy induces me to continue farming.	.910	.828
2. I might exit from farming without the policy.	.822	.675
3. Rural development policy helps increase farm income.	.881	.776
4. Rural development policy increases the international competitiveness of Korean farming.	.881	.775
5. I want to be supported by the policy.	.879	.773
Eigenvalue	3.828	
Variance	76.565	

Table A.28 Factor loadings and communalities of items for attitudes to farm exit barriers

Items	Factor loadings	Communalities
1. The above exit barrier does not discourage me from exiting farming.	.790	.624
2. The exit barrier does not make me more passive about preparing to exit farming.	.823	.677
3. I can exit farming even if the above barrier is not eliminated.	.770	.594
4. I am confident that I can eliminate the barrier for myself.	.823	.677
5. Non-farm jobs also have exit barriers.	.830	.688
Eigenvalue	3.261	
Cumulative variance	65.210	

Table A.29 Factor loadings and communalities of intentions about farm exit

Items	Factor loadings	communalities
1. I feel like exiting farming when I meet retired people.	.876	.768
2. I want to sell or lease my farmland rather than cultivate it myself.	.908	.825
3. I hope someone who will cultivate my farmland appears.	.874	.764
4. Farming work is hard for me to carry out.	.774	.599
5. I want to enjoy a life of retirement.	.906	.820
Eigenvalue	3.774	
Variance	75.544	

Table A.30 Results of binary logistics regression analysis between the characteristics of old farmers and whether or not farm exit takes place.

Categorical variables	Dummy variables	B	Wald	Sig.	Exp(B)
Age	6569	17.312	.000	.999	3.301E7
	7074	-3.448	.000	1.000	.032
	7579	7.152	.000	1.000	1277.043
Sex	Male	10.418	.000	.999	33451.373
Farming period	Under 10 years	3.801	.000	1.000	44.736
	1019 years	13.278	.000	.999	583986.633
	2029 years	-2.432	.000	1.000	.088
	3039 years	4.696	.000	1.000	109.533
Farming income	10-under 20	-21.261	.000	.997	.000
(Thousand KRW)	20-under 30	-9.950	.000	.999	.000
	30-Under 40	-19.456	.000	.999	.000
	40 and over	19.509	.000	.999	2.970E8
Off-farm income	0-Under 10	5.320	.000	.999	204.337
(Thousand KRW)	10-under 20	17.507	.000	.999	4.010E7
	20-under 30	21.773	.000	.999	2.856E9
	30 and over	5.431	.000	1.000	228.393
Years of schooling	No schooling year	-23.655	.000	.997	.000
	Middle school	22.749	.000	.997	7.585E9
	High school	-34.857	.000	.998	.000
	University	-9.418	.000	.999	.000
Number of children	1 person	-19.207	.000	.998	.000
	2 people	-43.008	.000	.997	.000
	3 people	-63.635	.000	.990	.000
	4 people	-10.454	.000	.998	.000
Spouse	With spouse	-22.590	.000	.995	.000
Help	With help	-32.355	.000	.998	.000
Region	City	-35.727	.000	.999	.000
Farming produce	Crops, livestock	-33.391	.000	1.000	.000
	Vegetables, fruit, flowers	31.382	.000	.997	4.256E13
	Crops, vegetables, fruit, flowers	-10.160	.000	.998	.000
	Crops, vegetables, fruit, flowers, livestock	14.295	.000	.999	1615559.666
	Landscape and other produces	42.393	.000	.993	2.576E18
Type	Livelihood	12.188	.000	.999	196358.028
	Income maximization	31.771	.000	.997	6.279E13

Farm exit barrier	Lack of successor	-9.591	.000	1.000	.000
	Lack of job opportunity	-24.722	.000	.998	.000
	Farming debt	-12.464	.000	.999	.000
	Others	1.539	.000	1.000	4.658
	Constant	-24.801	.000	.999	.000

Note: Enter method, 2 Log likelihood =.000, Cox & Snell R Square=.114, Nagelkerke R Square=1.000, farm exit or not coded as 1 for '*yes'* and 0 for 'No or others'. Wald=$(B/S.E)^2$

Table A.31 Result of multiple regression analysis between characteristics of old farmers and intentions about farm exit

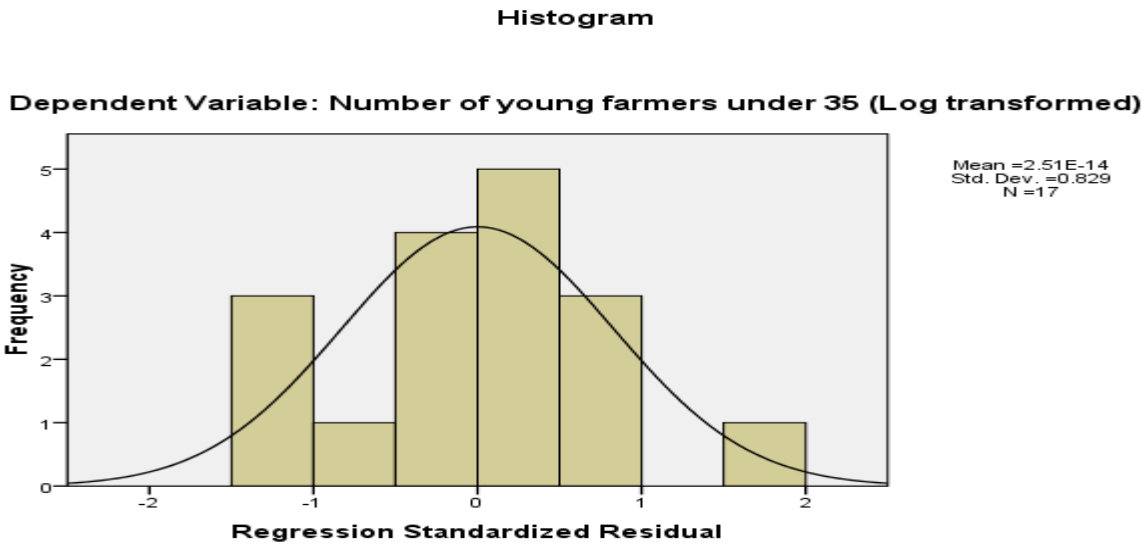
Categorical Variables	Dummy variables	B	β	*t*	*p*
	(Constant)	1.278		5.305	.000
Age	6569	.182	.073	1.204	.229
	7074	.083	.034	.525	.600
	7579	.252	.098	1.547	.123
Sex	Male	-.286	-.094	-1.591	.052
Farming period	Under 10 years	.014	.003	.051	.959
	10-19 years	.022	.006	.090	.928
	20-29 years	.123	.028	.517	.606
	30-39 years	-.020	-.007	-.121	.904
Farming income	10-under 20	.130	.047	.913	.362
(Thousand KRW)	20-under 30	-.460	-.114	-2.252	.025
	30-Under 40	-.099	-.030	-.553	.580
	40 and over	-.296	-.071	-1.378	.169
Off-farm income	Under 10	-.517	-.207	-3.825	.000
(Thousand KRW)	10-under 20	-.094	-.057	-.015	.754
	20-under 30	-.819	-.140	-2.686	.008
	30 and over	-.432	-.083	-1.506	.133
Years of schooling	No schooling year	.141	.034	.726	.469
	Middle school	-.092	-.031	-.618	.537
	High school	-.350	-.117	-2.092	.037
	University	.010	.002	.045	.964
Number of children	1 person	-.100	-.021	-.409	.683
	2 people	-.293	-.109	-1.809	.071
	3 people	-.201	-.090	-1.568	.118
	4 people	-.121	-.052	-.996	.320
Spouse	With Spouse	-.422	-.167	-3.237	.001
Help	With help	-.919	-.135	-2.864	.004
Region	City	.372	.043	.925	.356
Farming produce	Crops, livestock	-.118	-.024	-.475	.635
	Vegetables, fruit, flowers	-.388	-.069	-1.437	.152
	Crops, vegetables, fruit, flowers	-.066	-.033	-.611	.542
	Crops, vegetables, fruit, flowers, livestock	-.136	-.025	-.497	.619
	Landscape and other produces	-.304	-.061	-1.188	.236
Type	Livelihood	-.438	-.207	-3.576	.000
	Income maximization	-.646	-.228	-3.837	.000
Farm exit barriers	Lack of successor	.683	.279	2.451	.015
	Lack of non-farm Job opportunity	-.233	-.080	-1.639	.102
	Farming debt	.263	.076	1.357	.176
	Others	.257	.082	1.727	.085

* Note: Enter method, B: unstandardized beta, β: Standardized beta, p: significance value, ρ: Correlation coefficient when the other variables are controlled.

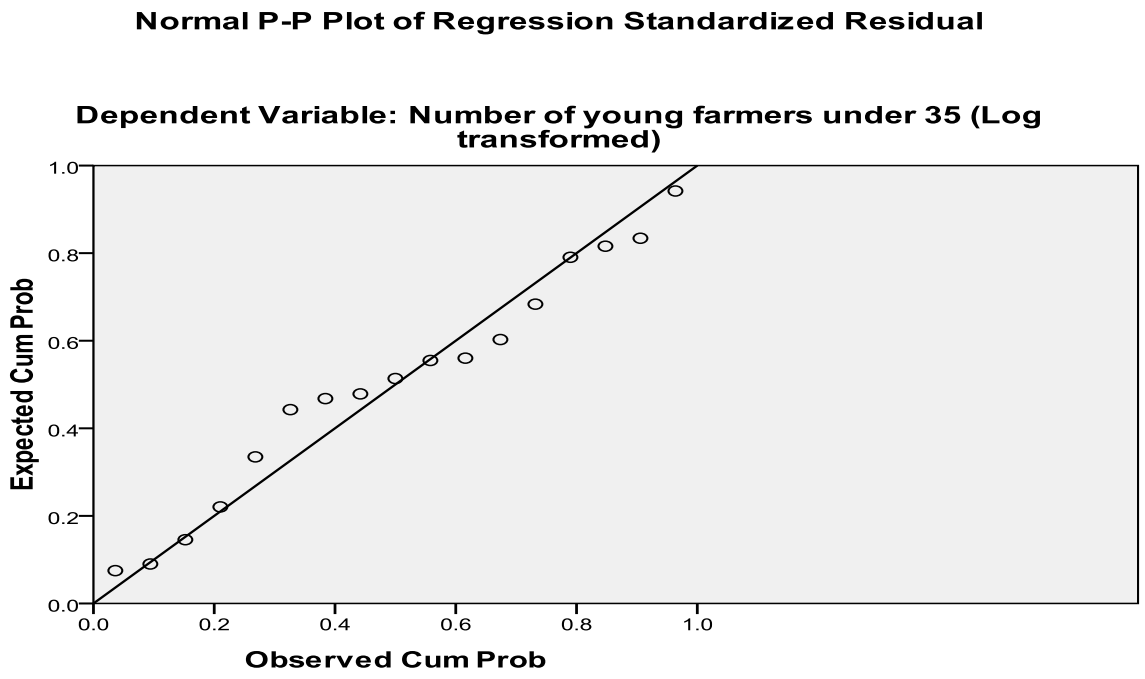
APPENDIX B (FIGURES)

Figure B.1 Test results for normality and homoscedasticity of regression model for young farmers

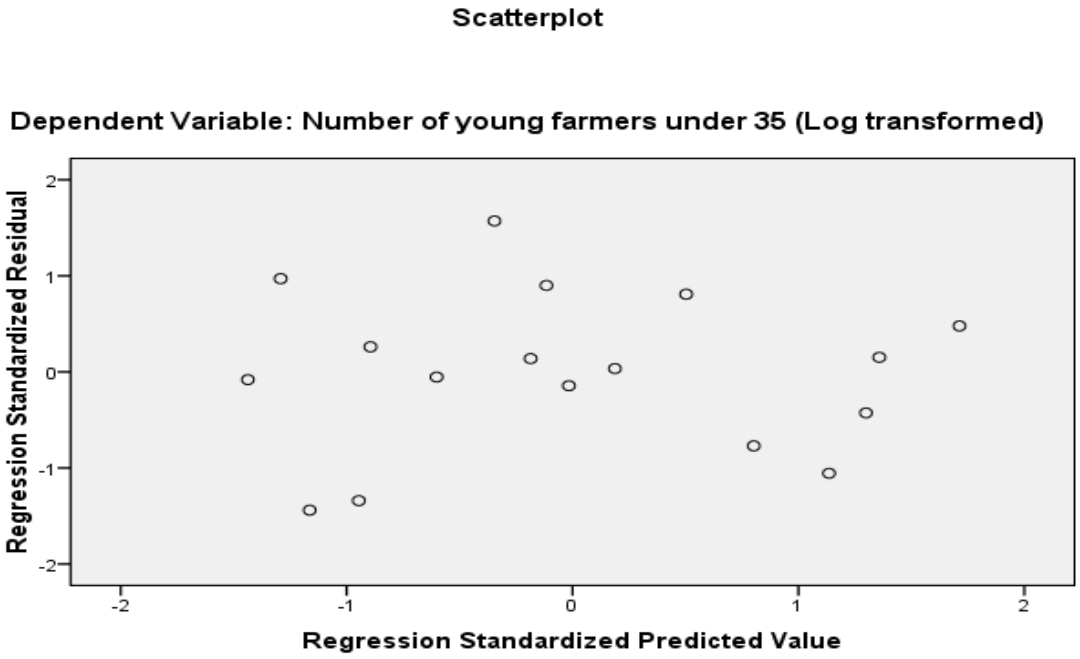
A histogram of standardized residuals



The normal probability plot



Scatterplots



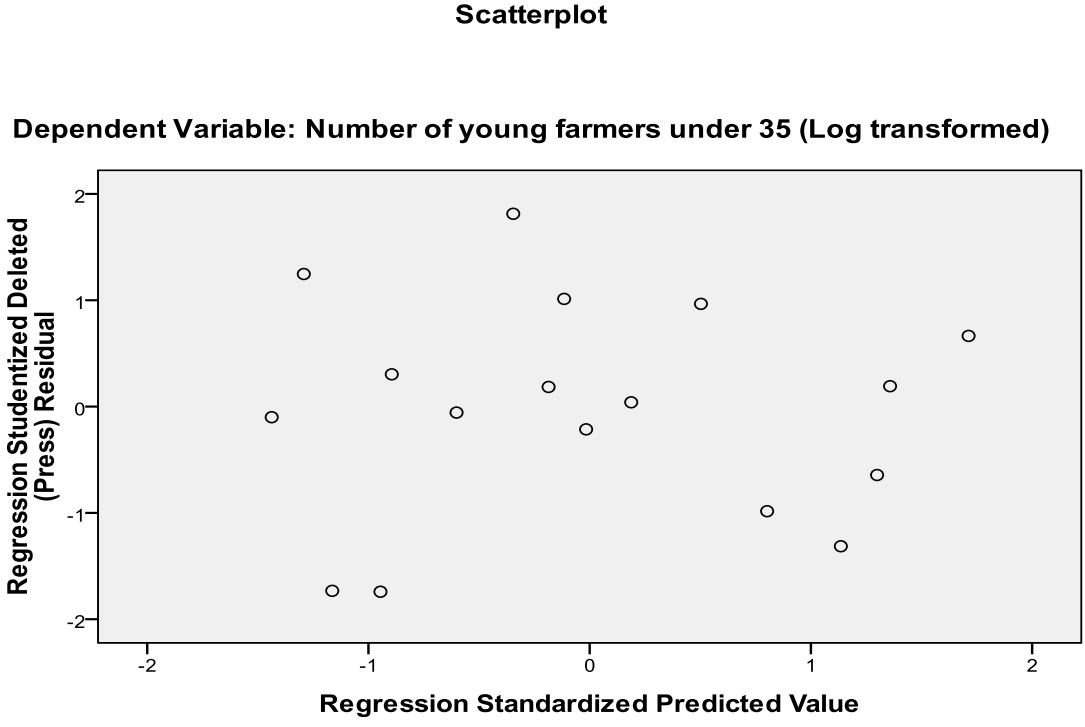
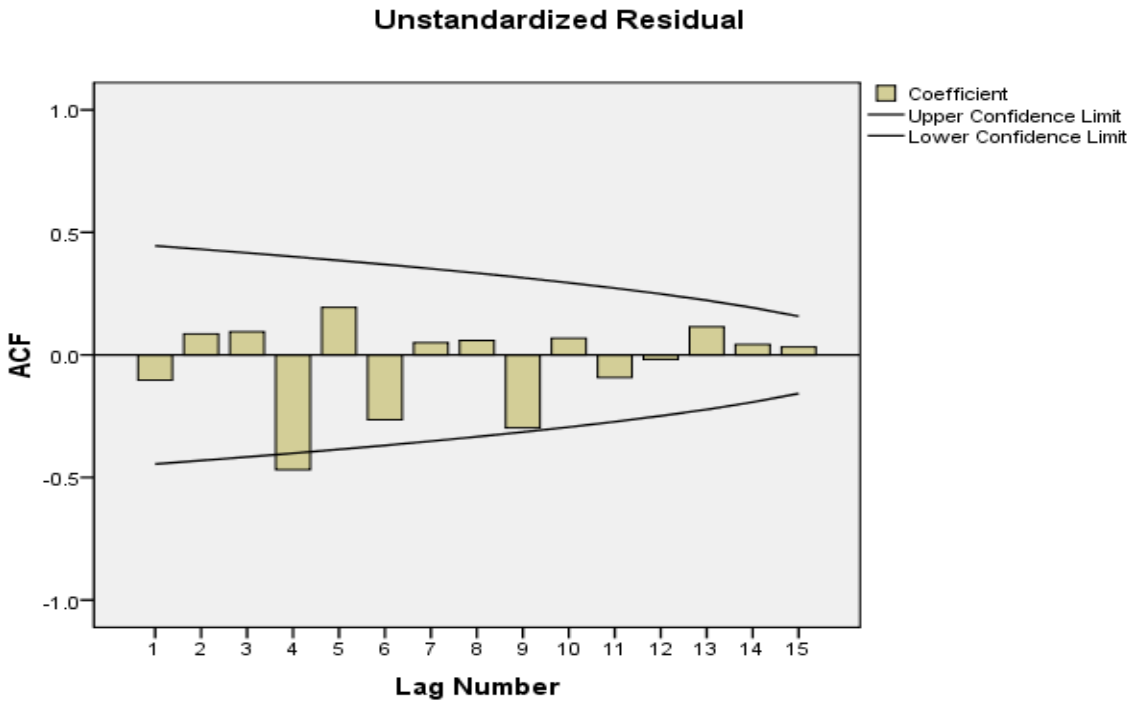


Figure B.2 ACF and PACF plots (The number of young farmers)



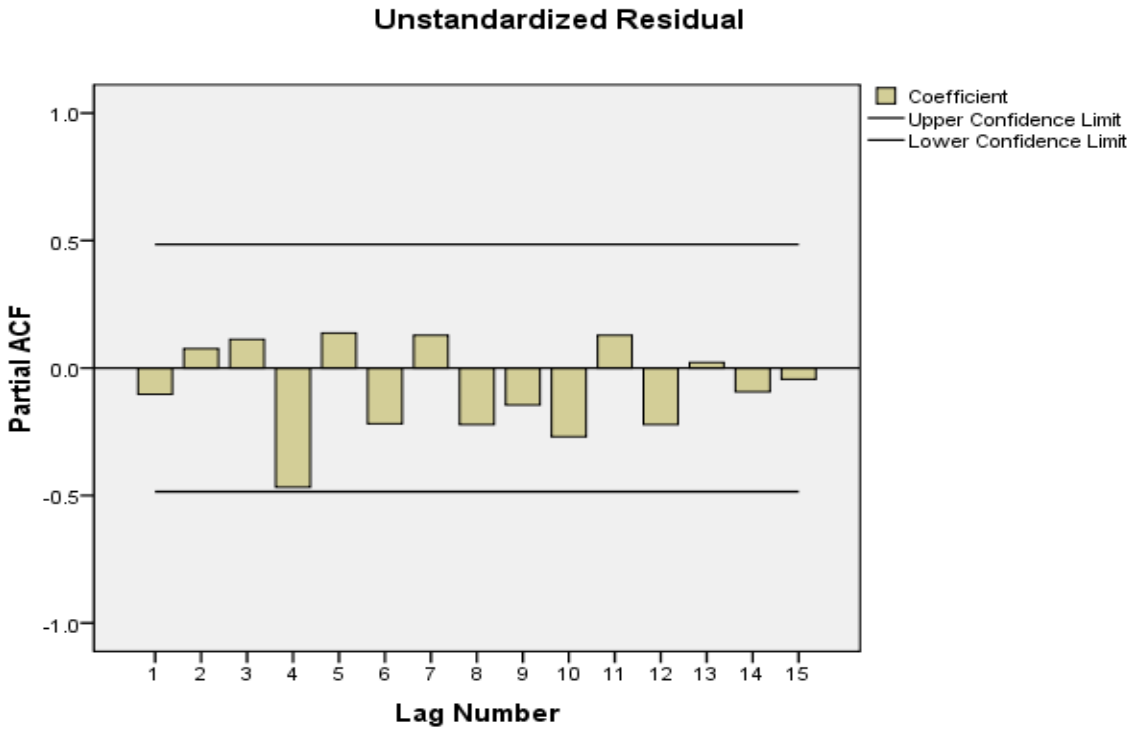
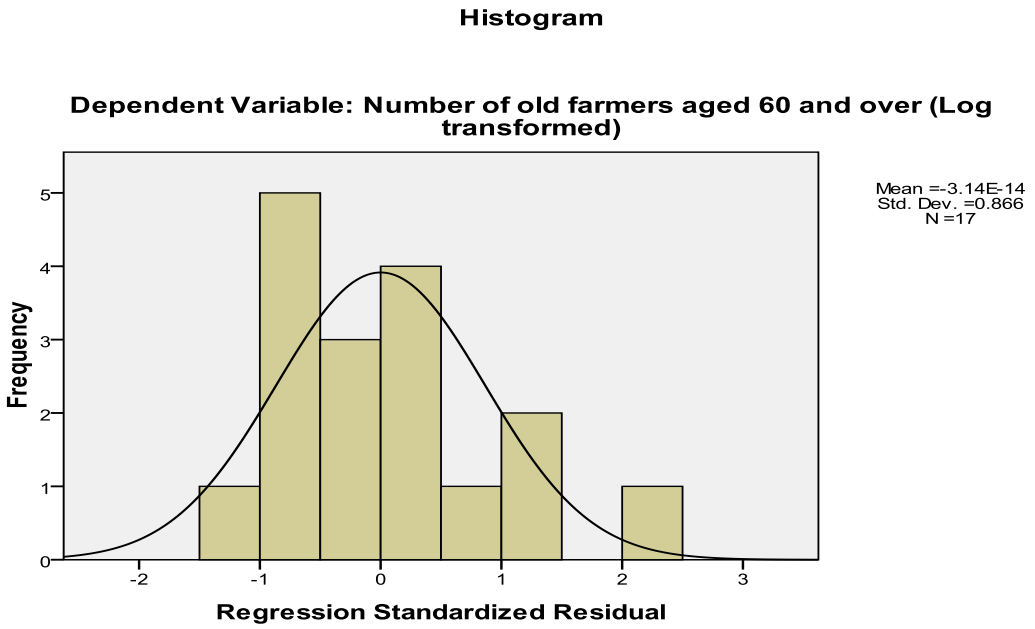
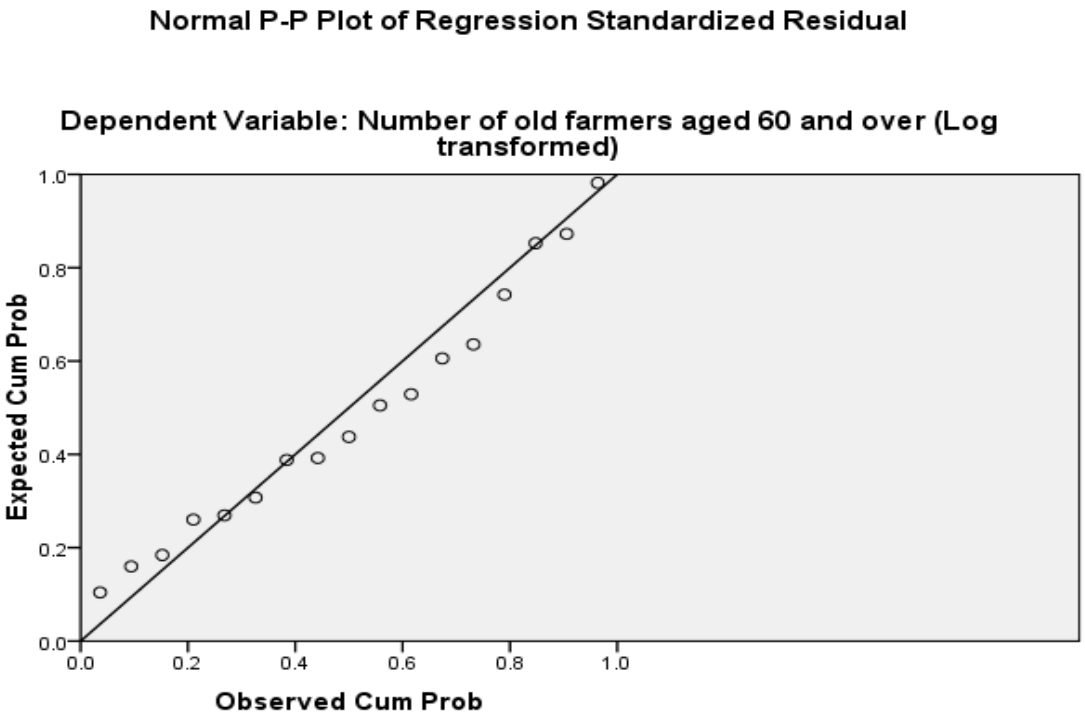


Figure B.3 Test results for normality and homoscedasticity of regression model for old farmers

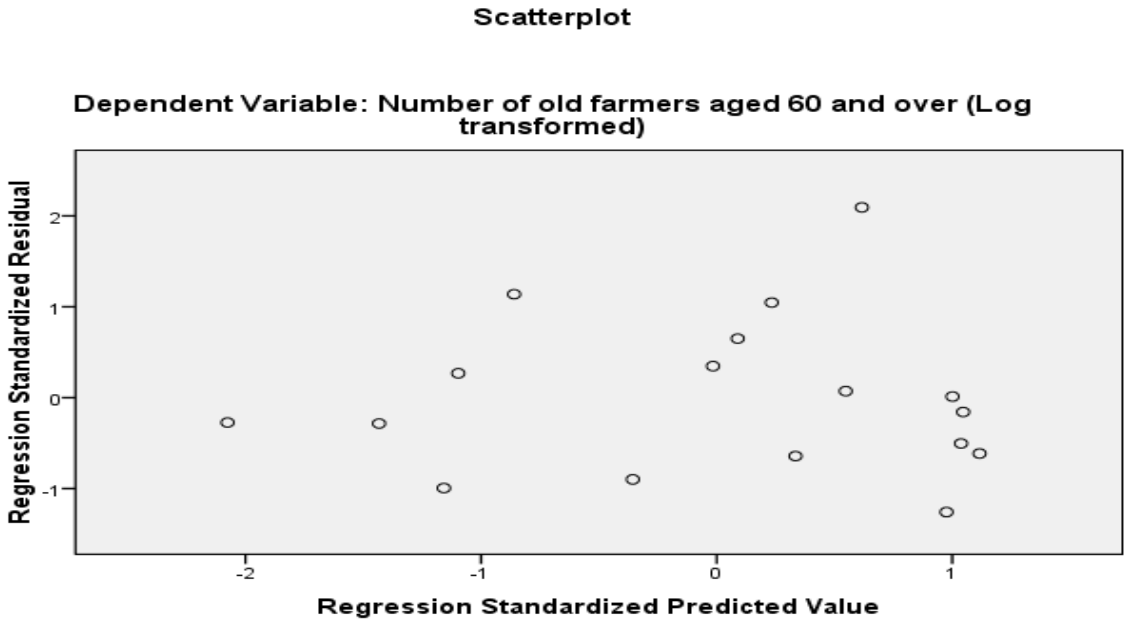
A histogram of standardized residuals



The normal probability plot



Scatterplots



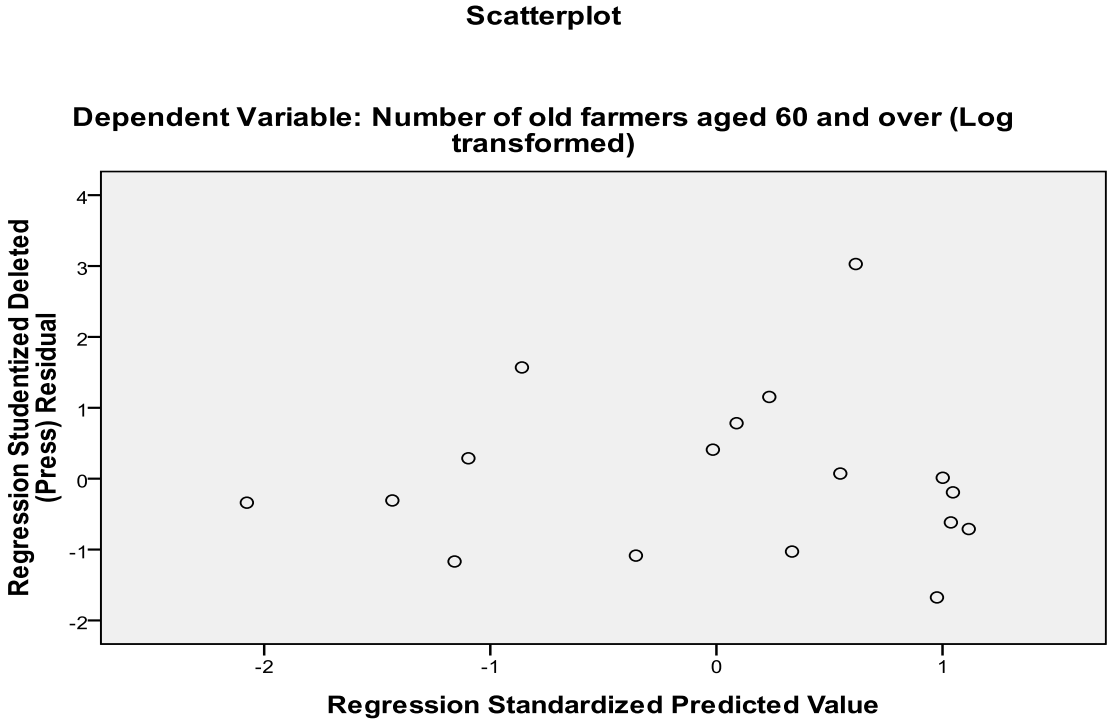
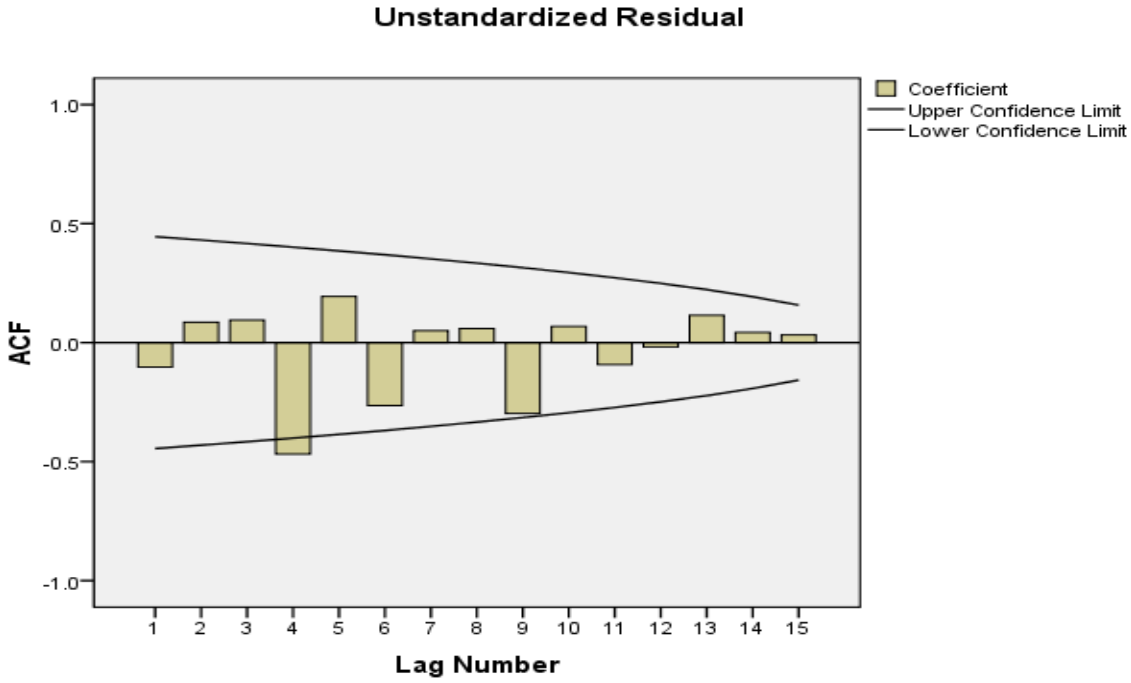
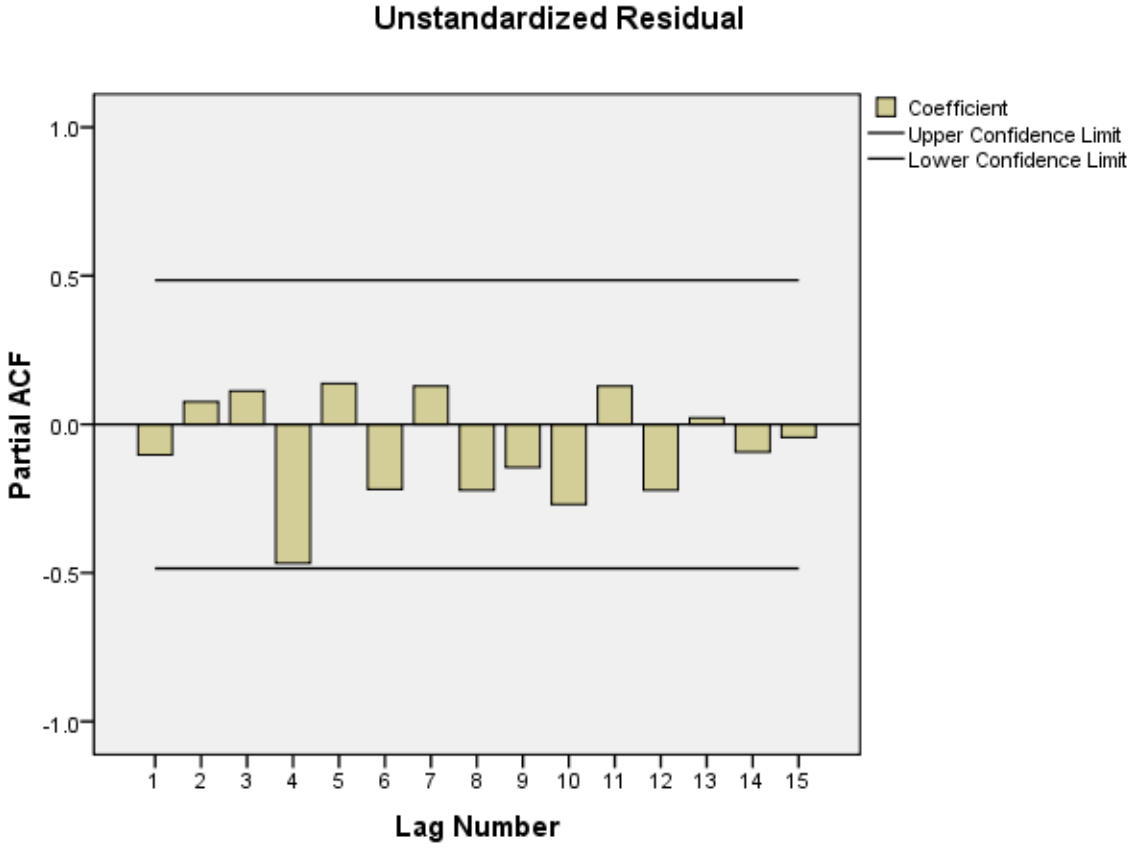


Figure B.4 ACF and PACF plots (The number of old farmers)





APPENDIX C (QUESTIONNAIRES)

Appendix C.1 The questionnaire for prospective farmers

Dear Respondent,

I am conducting a study on farm entry policy and farm exit policy and the effect of these, at the University of Birmingham in the UK. As part of this work, I am undertaking an in-person questionnaire survey on the farm entry of prospective farmers at this time.

This questionnaire contains short questions which ask for your responses on farming, farm entry policy, competitiveness policy, rural development policy, and farm entry and exit barriers. These are expected to give an insight into the effects of farm entry and exit policy.

This survey is to be filled in anonymously and your name and address are not required. And I also guarantee that your other information and your responses will not be shared, and will remain confidential and private.

Your participation is voluntary, and I suggest that you look over this questionnaire and then decide whether you want to participate in this survey. If you choose to answer this questionnaire, it should take about 10 minutes to complete. So, I hope you take the time to complete it, and return it to me when it has been completed.

If you have any questions about completing the questionnaire, please raise your hand. And if you want to know the result of this survey, please feel free to contact me via email (or by phone)

I really appreciate your attention and help.

February 2009

1. The following questions ask for basic information on you as a prospective farmer.

(1.1) The following questions ask about the characteristics of the respondent. Please tick the relevant boxes.

(1) What is your grade?	①1st	②2nd	③3rd
(2) What is your sex?	①Male	② Female	
(3) Are you an oldest child?	①Yes	②No	
(4) Where is your birth place?	①City	②County	
(5) Have you experienced farming on farmland?	①Yes	②No	
(6) What is your major subject in school?			

Crops	Vegetables	Fruit	Flowers	Livestock	Landscape Arch.	Others

(1.2) The following questions ask about your family. Please tick the relevant box and fill in a number.

(1) Are your parents engaged in farming as a main job?	①Yes	②No	
(2) How many brothers and sisters do you have?	(People)		

(1.3) The following questions are about your parents' farmland. Please respond only if your parents do farming.

(1) Which of these items do your parents cultivate or breed for income?

Crops	Vegetables	Fruit	Flowers	Livestock	Landscape arch.	Others

(2) What kind of area do your parents farm in?	①City	②County	

2. The following section is about type. Please tick the box for the statements with which you agree.

	Type
(1)	I prefer farming to a non-farm job. I am not interested in a non-farm job as my future occupation. Farming income, the quality of rural life, and the status of farmers are not important for me.
(2)	I have no preference between farming and a non-farm job. I will select a job which gives me more income, more social status, and a higher quality of life.
(3)	I prefer a non-farm job to farming. I would choose to be engaged in a non-farm job even if farming gave me more income. Farming is the last job that I would select.

3. The following section is about attitudes to farming. Please tick the relevant box for the statement(s) with which you agree.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. Farming income induces me to do farming.	①	②	③	④	⑤
2. The quality of life in a rural area induces me to do farming.	①	②	③	④	⑤
3. The social status of a farmer induces me to do farming.	①	②	③	④	⑤
4. Farming is a worthwhile occupation to be engaged in.	①	②	③	④	⑤
5. I would recommend my friends to do farming.	①	②	③	④	⑤

4. The following section is about agricultural structural adjustment policy

(4.1) The following statements are about farm entry policy. Please tick the relevant box for the statement(s) with which you agree.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. The successor farmer set-up program induces me to do farming.	①	②	③	④	⑤
2. The farming internship program induces me to do farming.	①	②	③	④	⑤
3. The new farmer tutoring program induces me to do farming.	①	②	③	④	⑤
4. The additional fund support program induces me to do farming.	①	②	③	④	⑤
5. Education at agricultural school induces me to do farming.	①	②	③	④	⑤

(4.2) The followings statements are about competitiveness policy, which includes things like education, R&D, farmland amalgamation, and development of infrastructure. Please tick the relevant box for the statement(s) with which you agree.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. Competitiveness policy induces me to do farming.	①	②	③	④	⑤
2. Competitiveness policy makes prospects for farming brighter.	①	②	③	④	⑤
3. Competitiveness policy increases farming income.	①	②	③	④	⑤
4. Competitiveness policy increases the attractiveness of farming.	①	②	③	④	⑤
5. I want to be supported by the policy.	①	②	③	④	⑤

(4.3) The followings statements are about rural development policy, which includes things like the promotion of rural tourism, farming products, and the food processing industry, which create non-farm jobs and improve living conditions. Please tick the relevant box for the statement(s) with which you agree.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. Rural development policy induces me to do farming.	①	②	③	④	⑤
2. Rural development policy makes prospects for farming brighter.	①	②	③	④	⑤
3. Rural development policy increases farming income.	①	②	③	④	⑤
4. Rural development policy increases the attractiveness of farming.	①	②	③	④	⑤
5. I want to be supported by the policy.	①	②	③	④	⑤

5. The following section is about farm entry barriers and attitudes to them.

(5.1) Which of the farm entry barriers listed below would be the most influential for you if you were to do farming. Please tick the item which would be the main barrier for you, or fill in another if there is one.

	Farm entry barriers	
①	Farming skills	
②	Funds	
③	Social status of farming or being a farmer	
④	Quality of life in rural areas	
⑤	Farming income	
⑥	Others (Please fill in the brackets on the right)	( )

(5.2) The following are questions about your attitude to the farm entry barrier which you selected in 5.1. Please tick the relevant box for the statement(s) with which you agree.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. The above entry barrier will not discourage me from doing farming.	①	②	③	④	⑤
2. The entry barrier does not make me more negative about entering farming.	①	②	③	④	⑤
3. I will start farming even if the above barrier is not eliminated.	①	②	③	④	⑤
4. I am confident that I can eliminate the barrier for myself.	①	②	③	④	⑤
5. Non-farm jobs also have entry barriers.	①	②	③	④	⑤

6. The following section is about your intentions about farming. Please tick the relevant box for the statement(s) with which you agree.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. Farming is appropriate to my aptitude and capability.	①	②	③	④	⑤
2. I can be successful as a farmer.	①	②	③	④	⑤
3. I want to live in a rural area.	①	②	③	④	⑤
4. I am preparing to be a farmer.	①	②	③	④	⑤
5. I will be happy if I can be engaged in farming.	①	②	③	④	⑤

7. The following question is about your job after graduation. Please fill in the box that fits you.

(7.1) Do you have to become engaged in farming shortly after graduation because you have an understanding with your parents, or other farmers, or your school?

Yes	No or Other

Thanks for your participation

Appendix C.2 The questionnaire for old farmers

Dear Respondent,

I am conducting a study on farm entry policy and farm exit policy and the effect of these, at the University of Birmingham in the UK. As part of this work, I am undertaking an in-person questionnaire survey on the farm exit of old farmers at this time.

This questionnaire contains short questions which ask for your responses on farming, farm entry policy, competitiveness policy, rural development policy, and farm entry and exit barriers. These are expected to give an insight into the effect of farm entry and exit policy.

This survey is to be filled in anonymously and your name and address are not required. And I also guarantee that your other information and your responses will not be shared, and will remain confidential and private.

Your participation is voluntary, and I suggest that you look over this questionnaire, and then decide whether you want to participate in this survey. If you choose to answer this questionnaire, it should take about 10 minutes to complete. So, I hope you take the time to complete it, and return it to me when it has been completed.

If you have any question about completing the questionnaire, please raise your hand. And if you want to know the result of this survey, please feel free to contact me via email (or by phone ( )

I really appreciate your attention and help.

February 2009

1. The following questions ask for basic information on respondents.

(1.1) The following questions ask about the characteristics of the respondent. Please tick the relevant boxes, or fill in a number.

1. What is your age?	(years)	
2. What is your sex?	①Male	②Female
3. How long have you been engaged in farming as an independent farmer?	(years)	
4. What has been your annual farming income in the last three years?	(KRW)	
5. Do you have a non-farm job?	①Yes	②No
6. How much off-farm income, which includes non-farm job income and subsidy from other people, do you have?	(KRW)	

7. How much schooling have you had?

No schooling	Elementary school	Middle school	High school	Under graduate	Graduate

(1.2) The followings questions ask about your family. Please fill in a number and tick the relevant boxes.

1. How many children do you have, irrespective of your marital status?	(People)	
2. Does your spouse farm with you?	①Yes	②No
3. Are there children who help you with your farming?	①Yes	②No

(1.3) The followings questions ask about your farmland. Please tick the relevant boxes.

1. Where is your farmland?	①City	②County

2. Which are items which you cultivate or breed to sell at market?

Crops	Vegetables	Fruit	Flower	Livestock	Landscape	Others

2. The following section is about your preference for farming or leisure. Please tick the box for the statements that describe you.

	Preference to farming and leisure
(1)	I have to do farming, irrespective of the income it brings me. I cannot get a non-farm job.
(2)	I will decide whether to continue farming or not according to the size of my income from farming. I can get a non-farm job.
(3)	I want to exit farming rather than do farming. The size of my income from farming is not important for me.

3. The following section is about attitudes to farming. Please tick the relevant box for the statement(s) with which you agree.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. Farming income induces me to continue farming.	①	②	③	④	⑤
2. I think prospects for farming are bright.	①	②	③	④	⑤
3. I think a non-farm job is also physically difficult.	①	②	③	④	⑤
4. A rural area is convenient to live in.	①	②	③	④	⑤
5. A farmer's life is a happy one.	①	②	③	④	⑤

4. The followings section is about agricultural structural adjustment policy.

(4.1) The following statements are about the farm exit policy (Direct payment for farmland transfer program). Please tick the relevant box for the statement(s) with which you agree.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. The direct payment program for farmland transfer strongly affects my decision on whether to exit farming or not.	①	②	③	④	⑤
2. An increase in subsidy would facilitate my farm exit.	①	②	③	④	⑤
3. The present subsidy is not insufficient for me to exit from farming.	①	②	③	④	⑤
4. I think the program is effective in inducing farm exit.	①	②	③	④	⑤
5. I hope the program continues.	①	②	③	④	⑤

(4.2) The following statements are about competitiveness policy, which includes things like education, R&D, farmland amalgamation, and development of infrastructure. Please tick the relevant box for the statement(s) with which you agree.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. Competitiveness policy induces me to continue farming.	①	②	③	④	⑤
2. Without the policy, I might exit farming.	①	②	③	④	⑤
3. Competitiveness policy helps increase farm income.	①	②	③	④	⑤
4. Competitiveness policy increases the international competitiveness of Korean farming.	①	②	③	④	⑤
5. I want to be supported by the policy.	①	②	③	④	⑤

(4.3) The followings statements are about rural development policy, which includes things like the promotion of rural tourism farming products, and the food processing industry, which create non-farm jobs and improve living conditions. Please tick the relevant box for the statement(s) with which you agree.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. Rural development policy induces me to continue farming.	①	②	③	④	⑤
2. I might exit from farming without the policy.	①	②	③	④	⑤
3. Rural development policy helps increase farm income.	①	②	③	④	⑤
4. Rural development policy increases the international competitiveness of Korean farming.	①	②	③	④	⑤
5. I want to be supported by the policy.	①	②	③	④	⑤

5. The following section is about farm exit barriers and attitudes to them.

(5.1) Which of the farm exit barriers listed below would be the most influential in preventing your exit from farming? Please tick the item which would be the main barrier for you.

	Farm exit barriers	
①	Absence of a successor	
②	Income shortage after retirement	
③	Difficulty of getting a non-farm job	
④	Farming debt	
⑤	Others (Please fill in the brackets on the right.)	( )

(5.2) The following are questions about your attitudes to the farm entry barrier which you selected in 5.1. Please tick the relevant box for the statement(s) with which you agree.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. The above exit barrier does not discourage me from exiting farming.	①	②	③	④	⑤
2. The exit barrier does not make me more passive about preparing to exit farming.	①	②	③	④	⑤
3. I can exit farming even if the above barrier is not eliminated.	①	②	③	④	⑤
4. I am confident that I can eliminate the barrier for myself.	①	②	③	④	⑤
5. Non-farm jobs also have exit barriers.	①	②	③	④	⑤

6. The following section concerns your intentions about farm exit. Please tick the relevant box for the statement(s) with which you agree.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. I feel like exiting farming when I meet retired people.	①	②	③	④	⑤
2. I want to sell or lease my farmland rather than cultivate it myself.	①	②	③	④	⑤
3. I hope someone who will cultivate my farmland appears.	①	②	③	④	⑤
4. Farming work is hard for me to carry out.	①	②	③	④	⑤
5. I want to enjoy a life of retirement.	①	②	③	④	⑤

7. The following question is about whether you will exit farming or not. Please fill in the box that fits you.

(7.1) Do you have to exit farming because you have an understanding with your children, or other people, or the government?

Yes	No or Other

Thanks for your participation